Cotton

With the Author's Compliments.

Falkland Cryptos.

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OF MYCOLOGY

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Cryptogams from the Falkland Islands collected by Mrs. Vallentin, and described by A. D. Cotton, F.L.S.

(Plates 4–10.)

[Read 5th November, 1914.]

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PREFACE.

So far as flowering plants and ferns are concerned, the flora of the Falkland Islands may now be said to be thoroughly known. An account by Mr. C. H. Wright was published three years ago in the 'Journal of the Linnean Society,' his paper being the outcome of the study of extensive collections made by Mrs. Elinor Vallentin in 1898 and 1899 and presented to Kew a short time previously. With a view to making his account as complete as possible, Wright examined the older collections and incorporated previous records, and, by giving data as to localities and collectors, showed some of the changes which had taken place since the publication of the 'Flora Antarctica.' Since the appearance of his paper, a memoir on the same subject has been published by Skottsberg, who, in addition, describes the vegetation from an ecological standpoint.

When Mrs. Vallentin was about to return to the Falkland Islands in 1909, it was suggested to her that the cryptogamic flora would well repay investigation. Nothing of importance had been added to the Kew collections since the magnificent series collected by Hooker in 1842 and described in the 'Flora Antarctica,' and, though our knowledge of the lower plants had since then largely increased, scarcely a paper in which the cryptogams of the Falkland Islands were included had appeared. Mrs. Vallentin readily assented. An account of her collections of marine algæ, lichens, and fungi is set forth below, the mosses and hepatics being dealt with by Mr. Wright in a separate paper.

INTRODUCTION.

The present paper is divided into three main sections, dealing with the marine algæ, lichens, and fungi respectively. So far as the purely systematic work is concerned, each section is complete in itself, but in preparing the historical sketch, and in considering the geographical relationships of the flora, it was more convenient to treat all the cellular cryptogams together. These two subjects, therefore, and also some floristic notes, are dealt with in a special section, before the general systematic account, entitled "The Cryptogamic Flora."

In the three sections referred to, not only are Mrs. Vallentin's plants enumerated, but also, as far as possible, all previous records. Each section therefore forms a complete list of the known flora of the group in question. With regard to the algæ, the value of the list is increased by a considerable amount of critical work which it has been possible to include. In the case of the lichens, time did not permit of research of this kind, hence most of the older records have been accepted without question; and in the third group—the fungi—there was little previous work to revise. To make the series complete, a list has been compiled of the fresh-water algæ known from the islands.

1. Mrs. Vallentin's Collections.

The collections made by Mrs. Vallentin in 1909–1911 are entirely from the western islands, an area of the Falklands which, so far as cryptogamic botany is concerned, had been practically unexplored. Of the three groups of plants dealt with in the present paper, the marine algæ figure most largely, some 400 herbarium specimens having been mounted. The lichens follow; these, being dried without pressure and packed in boxes, arrived in good condition and, being accompanied by coloured drawings, form excellent material for museum or exhibition purposes. But it was to the fungus flora, hitherto almost unknown, that Mrs. Vallentin paid special attention. Some fifty species were collected. In the case of the Agarics, great care was taken and coloured drawings accompanied the spirit or formalin material

Thanks to careful packing, the material arrived in a good state of preservation and several very interesting plants have been recorded. The Agarics, however, proved exceedingly difficult to determine with any degree of certainty, and it was with great regret that not a few of the delicate species of this group had to be left unnamed. The series of coloured drawings will eventually be incorporated in the Kew collections, and will be available for future reference.

The results obtained from the above collections are dealt with in detail in the respective sections—suffice it to say here that, apart from the value of the collections as such, they have provided several new species and a number of new records, and incidently led to the clearing up of various questions of systematic and geographical importance.

Mrs. Vallentin writes as follows with regard to help received from friends in the Falklands :—

"My grateful thanks for assistance and help are due to His Excellency The Governor of the Falklands and Mrs. Allardyce, also to W. H. Harding, Esquire, and W. C. Girling, Esquire, both of the Falkland Islands Co., and to Mr. and Mrs. Vere Packe and Mrs. O. Dean, all of Stanley. To Messrs. Homstead and Blake and to their courteous manager, Mr. Sydney Miller, and Mrs. Miller, through whose hospitality and kindness we were able to reside at Hill Cove and Shallow Bay and add considerably to our collections. From Mr. and Mrs. Benney, Mr. and Mrs. Buckworth of West Falklands, we also received much help. For valuable specimens added to my collections of algæ my acknowledgments are due to Mrs. Halliday of West Point Island, and to Miss Harriet Goodwin of Shallow Bay. Lastly, to my husband, Mr. R. Vallentin, for his valuable care and advice in the management and transport of my collections."

2. Notes on the Collecting-ground and Vegetation.

The following notes by Mrs. Vallentin indicate the areas from which the collections, especially those of the algæ, were obtained, and they give at the same time a clear idea of the vegetation in general :—

"The Falkland archipelago, the largest cluster of islands in the South Atlantic, lies approximately between 51° 15′–52° 30′ S. lat. and 57° 40′–62° 25′ W. long., and about 350 miles N.W. of the Straits of Magellan. Speaking generally, they occupy the same position in the southern hemisphere that Great Britain does in the northern. They consist of East Falklands (area 3000 square miles) and the West Falklands (2300 square miles), and numerous islands and islets, totalling about 7000 square miles. Mount Adam, the highest peak, 2360 ft., is located on the western island and, being near our headquarters, was carefully explored. This range culminates on West Point Island with its stupendous cliffs 1200 feet in height. The

Wickham Heights run almost due east and west across the East Island, the highest peak being Mount Usborne, 2245 feet. The climate is bleak and the penetrating power of the wind extraordinary; but the temperature is fairly equable, ranging from 19° F.–42° F. in winter and from 34° F.–72° F. in summer.

"Up to comparatively recent times the descendants of the cattle landed by Bougainville on the East Island and those landed by sealers and others on the Western Island rambled everywhere, but, owing to their comparatively small numbers, they did not appreciably affect the flora. About the year 1867 sheep were introduced, and with them came Scotch shepherds. With their régime a rapid change took place over the whole archipelago and wholesale burning of the 'heather' (*Empetrum rubrum*) and grasses followed every spring-time.

"When the late Mr. W. W. Bertrand first settled on the West Falklands the grass on the plains was waist deep, and whole flocks of sheep would disappear into hidden brooks and streams which were effectually concealed by this rank vegetation. Darwin's statement ('More Letters,' vol. i. p. 380) that the 'struggle for existence of plants with hostile animals is of supreme importance' is very plainly illustrated on the Falkland archipelago flora. Sheep deteriorate and eventually destroy the pasture-lands over which they graze, and this fact is very apparent when one follows up a vast flock while feeding. They pull up whenever possible the tufts of the finer grasses by the roots, and orchids and Tussac grass are eaten down to the ground, in the case of the former plants the bulbous roots being even devoured, so that it is useless to look for plants in the sheep-paddocks. Sheep also nibble the young shoots of *Chiliotrichum amelloideum* and *Veronica elliptica*, destroying in places whole valleys of the former to which they have access. The delicate agarics are nearly all to be found in the shelter of the former shrub in deep valleys rich with humus.

"Most of the lichens were collected in the uplands near Roy Cove at a height of about 150–300 ft., where foliaceous and fruticolous species abound. One of the most interesting is *Parmelia lugubris*, which is found in great abundance where *Empetrum* covers the hills. When moist it is a very delicate green and black underneath with brown tips, when dry the green pales and it is practically black and white. Owing to its hollow thallus inflated with air, detached pieces are carried for miles by the wind, and it is thus plentiful all over the uplands. Cup-lichens (*Cladoniæ*) are especially common on burnt or half-burnt bogs. The foliaceous forms (species of *Parmelia* and *Sticta*) are often much injured by sheep, so that great difficulty is experienced in obtaining perfect specimens. Even on exposed summits, such as Rame Head and Mount Adam, a very luxuriant lichen vegetation exists, the beautiful *Neuropogon melaxanthum* being particularly fine and forming a veritable miniature forest.

"The littoral of the islands is fringed with *Empetrum rubrum*, the 'heather' of these climes, but this never extends many miles inland. A belt of maritime lichens, of which *Ramalina terebrata* is one of the largest and most conspicuous, is noticeable on the shore, and the beautiful orange-red alga (*Trentepohlia polycarpa*) is also especially common on maritime rocks.

"The coarse white grass (*Arundo pilosa*), which gives to the pasture-lands in sunshine a corn-golden tone, covers vast areas, and 'Fachina' (*Chiliotrichum amelloideum*), on which a new Uredine was found, fills the valleys, the sweet-scented *Veronica elliptica* occurring only on the littoral of the Western Island. Immense tracts of ground are rendered quite useless by the two ferns *Lomaria alpina* (=*Blechnum Penna-marina*, Kuhn) and *L. magellanica* (=*Blechnum tabulare*, Kuhn), which no animal will devour, but their uselessness is in some measure compensated for by their varied hues, which add to the beauty of the undulating land. That most striking plant *Bolax glebaria*, which drew forth from Penrose some quaint and original remarks in his account of the British Settlement on Saunders Island in 1775, flourishes everywhere. On the dead stems of this plant, as also on the *Veronica* and *Lomaria*, delicate epiphytic Agarics were found (*Pleurotus* spp.?), but these unfortunately proved indeterminable.

"The streams of stones or 'stone runs' are one of the best-known features of the whole archipelago. They are more common on the eastern island than elsewhere, and are interesting botanically on account of their islets of vegetation. Saxicolous lichens are plentiful on the boulders composing the 'runs.' Sand-hills, like the dunes in the eastern counties of England, occur in many places, and in some instances they are covered with a luxuriant growth of *Senecio candicans* and *Chiliotrichum amelloideum*. It was presumably on this type of ground that the curious fungus *Bulgaria arenaria*, Lév., reported by Gaudichaud, but not since re-discovered, was gathered.

"With regard to the marine algæ, enormous quantities of 'Kelp' are washed ashore, and after severe gales banks may at times be seen 6 feet high and 10–15 yards wide, stretching for 100 yards or more along the shore. This represents many tons of *Durvillea*, *Macrocystis*, and *Lessonia* torn up and hurled ashore from deep water. One fact particularly attracted my attention during a big on-shore gale, and I noted it also on several subsequent occasions. When the 'Kelp' is being torn up and the fronds and stems are being broken by the fury of the elements, the mucilaginous substance exuded from these broken seaweeds is so great that it has almost the effect of oil in smoothing the crests of the waves. This is at times so markedly the case that the rollers lose much of their danger.

"Our chief collecting-grounds for algæ were West Point Island, Roy Cove, and Shallow Bay, but in addition to these we were able to wander many miles along the sheltered creeks and fiords on most parts of the West Falklands.

"*West Point Island.*—On this island, 35 miles from our headquarters, there is only one real shore-collecting area, namely, along the strand below the settlement. Elsewhere furious seas sweep the shores, and collecting is confined to 'beach combing,' *i. e.* turning over 'Kelp' thrown on the beach after gales. In the cove below the settlement some excellent collecting was done, and it is from this spot that the majority of the sea-weeds labelled 'West Point Island' were obtained. The beach within tidal limits is composed of ground-up quartzite with rounded boulders scattered here and there. Along the northern edge of this cove are many rock-pools teeming with various sea-weeds. Beyond this is the ever-present 'Kelp,' *Macrocystis*, which fringes the shores.

"*Hope Harbour.*—On the mainland opposite West Point Island is Hope Harbour, a large and almost land-locked natural indentation of the coast. Along its shores on the northern boundary rock-pools abound, while the southern shore is sandy with rocks interspersed. At the head of the harbour is a fresh-water stream which is frequented at spring tides during summer and autumn by large mullet. The majority of the rocks are small enough to be turned over with the hand, and littoral life is plentiful owing to the sheltered position.

"*Roy Cove.*—Another natural indentation of the coast, and placed on the northern shore of King George's Bay. It was in this place that we spent nearly a year, and were thus able to dredge and make large collections. The creek is about a mile and a half in length, and as the rocky sides are mostly steep, with a tidal rise and fall of ten feet at springs, it forms an ideal place for zoological and botanical collecting.

"For convenience of description the creek is easily divided into three parts—an outer, a middle, and an inner basin,—each part being connected with the other by a narrow strip of water. From the inner basin this estuary divides into two parts, each being derived from a stream of fresh water which flows down into it from the valleys. The shores within tidal limits are rocky, being formed of quartzite and being cut up into rocky pools and sheets of fantastic shapes, especially above high-water mark. During the winter, if the weather is at all severe, ice forms in the creek; and within living memory a solid sheet has been observed extending from the mouth to the extreme ends. Although waves break across the entrance, they never extend beyond the first basin, and it is in this region and especially in the second expansion that the fauna and flora are most luxuriant. Above this point the fresh water seriously affects the littoral fauna and flora, although in the deeper water the dredge continues to capture interesting forms.

"*Shallow Bay.*—This bay, where we lived for six months, is shallow, very inaccessible, and absolutely land-locked. It is about 30 miles north-east as the crow flies from Roy Cove, and really forms a continuation of Port Egmont, being part of an inner passage to Tamar Harbour, the first port on the north coast of the West Falklands. The whole of Shallow Bay is

practically a vast submerged bed of *Mytilus magellanicus*, in which a small quantity of *M. edulis* is mixed ; seaweeds, red and brown, are fairly common on the rocks and also in the tidal pools.

"*Port Egmont.*—A large natural harbour open to the north with good anchorage, and the original British settlement of the island. Unfortunately no dredging could be done here, but various seaweeds were gathered along the southern shore between tide-marks. Reef-channel is a very dangerous winding passage leading from the south side into Byron Sound. The tide here runs at 8–10 miles an hour, and seaweeds abound on the rocks and also in the pools throughout its whole length. Rocks, large and small, are scattered along the shores, and these, while being large enough to withstand the rushing waters, are easily turned over by the hand ; hence the locality is an ideal collecting-ground for the botanist and zoologist."

3. Acknowledgments.

In working out the present material it is a pleasure to acknowledge the help received from botanists of the British Museum, from Miss A. Lorrain Smith for assistance with several lichens, and from Mr. A. Gepp in connection with Antarctic algæ, with which he and Mrs. Gepp have been so much associated. My thanks are also due to Dr. O. V. Darbishire and to Mr. W. B. Grove for help with Antarctic lichens and Uredineæ respectively, and also to Madame Weber-van Bosse for kindly lending some type-specimens of algæ from Kützing's herbarium now in her possession.

Finally, the valuable work of Madame Paul Lemoine, D.Sc., must be gratefully acknowledged. Few marine algæ have been so much confused and neglected as the Lithothamniæ and the Melobesiæ, and the value of expert knowledge in this group is specially necessary. Madame Lemoine had lately been engaged in a revision of all the Antarctic species, and she kindly consented to examine Mrs. Vallentin's specimens and compare them with authentic material. Her report, which includes interesting notes, is published as received, at the end of the section on algæ.

I. THE CRYPTOGAMIC FLORA.

1. Historical Résumé of Previous Work.

The following sketch deals with all the previous collections of cellular cryptogams made in the Falkland Islands, and, in addition, the results of the most important expeditions to Fuegia and the adjoining mainland are alluded to.

The early botanical exploration of these regions was carried out almost exclusively by the French, the flowering plants naturally receiving foremost attention. The first reference to the cryptogamic vegetation of the Falkland Islands is by Pernety who accompanied Bougainville, the famous French

soldier and traveller, in his expedition to found in 1764 a French colony in those islands. In Pernety's 'History of the Voyage' (1771)* a full account of the new colony is given, together with a good map, views, and notes on natural history. He refers more than once to the vast beds of "sea-grass," *Macrocystis*. A few years later the French botanist Commerson (see Oliver, '09) accompanied Bougainville in his voyage round the world, and to him is due our earliest knowledge of the cellular cryptogams of the Cape Horn region. He collected in 1767 several lichens, an alga (*Trentepohlia*), and a fungus (*Cyttaria*) in the Magellan Straits, and his plants are now in the Paris Museum, though a few duplicates found their way both to the British Museum and Kew. Considerable space is devoted to this region in Bougainville's own narrative (1771), which was translated into English the same year. An account by Penrose (1775) of his visit to the Falklands in 1772 is also of interest.

Unsettled times followed in the political history of the islands, and for close on fifty years little additional botanical information was forthcoming. During the 'Uranie' and 'Physicienne' Expedition (1817–20), commanded by Freycinet, Gaudichaud made large collections in the Falklands, and, though owing to the wreck of the 'Uranie' in Berkeley Sound most of his valuable finds were lost, he was able, in his report on the flora of the islands, to list 21 algæ, 19 lichens, and 2 fungi (Gaudichaud, '25, pp. 96–97).

During the voyage of the 'Coquille' under Duperrey (1822–25) considerable attention was paid by d'Urville to Falkland Island plants. In the "Flore des Malouines," which he published in the 'Mémoires de la Société Linnéenne de Paris' (1826), he devotes several paragraphs to observations on large seaweeds, and his list of the flora contains 32 algæ, 34 lichens, and 2 fungi. These include Gaudichaud's records (slightly modified) as well as the material collected by Lesson and himself which had been determined by Bory de Saint Vincent. The same list appears in the full account of the 'Uranie' and 'Physicienne' Expedition (Freycinet, 'Voyage autour du Monde,' 1826), as Gaudichaud was able in the chapter on the Falkland Islands flora (pp. 123–143) to include d'Urville's plants which had been published in the Mémoires of the Linnean Society of Paris. In Duperry's account of the 'Coquille' Expedition, the volume on the cryptogams was prepared by Bory, who deals at length with d'Urville's collections, but does not distinguish the Falkland Island flora as such.

In Weddell's account of his remarkable voyage to the Antarctic ('25), considerable information is given as to the Falklands, including a map of Berkeley Sound, in which the "islands" of *Macrocystis* are indicated.

The 'Astrolabe' and 'Zelée' Expedition (1837–40), commanded by d'Urville, further explored the Magellan region and collected many plants

* See Bibliography, p. 226, arranged under four headings.

including algæ and lichens, but the Falkland group was not visited (see Montagne, '42–5).

In a revision by Crié of the plants obtained by these earlier collectors a few epiphytic fungi are recorded ('78).

The 'Beagle' visited the Falklands in 1833 and 1834. The collections made by Captain King, and later by Darwin, included several lichens and algæ. These were dealt with by Hooker in the great work mentioned in the following paragraph, and the plants are mostly at Kew. An excellent account and historical sketch of our islands is given by Fitzroy in his narrative of the second 'Beagle' voyage (see King, '39).

With 1842 we come to the visit of the 'Erebus' and 'Terror.' Sir Joseph Hooker writes in the introduction to the 'Flora Antarctica' :—"A prolonged stay in the Falkland Islands, though the season was winter (April to the beginning of September), afforded opportunity for thoroughly investigating the flora of that interesting and now highly important group, which, though it had been partially examined by Admiral d'Urville and previously by the officers of that unfortunate ship the 'Uranie' under command of Captain Freycinet, still afforded considerable novelty" (Part I., p. ix). And later he states :—"During which year (1842) almost all the previously known species were gathered, with numerous others, specially Cryptogamia, by myself and Dr. Lyall, whose beautiful collections of the interesting algæ of this group of itself forms an important addition to antarctic Botany" (p. 215). He also acknowledged algal accessions to his herbarium from Captain Sulivan, Mr. Wright, and Mr. Chartres, surgeon H.M.S. 'Philomel.'

The results of Hooker's explorations are published in full and summarised in the 'Flora Antarctica,' Part II., though this was preceded by several preliminary papers. With regard to cellular plants, the algæ are dealt with by Hooker and Harvey, the lichens by Hooker, and fungi by Berkeley. The pages of that work testify to the care bestowed upon the collections, and the thoroughness of the collecting is proved by the comparatively few additions, except in the case of small and microscopic species, since made to the flora. With reference to the changes which it has been necessary to make in nomenclature, most of these are due to different conceptions which obtain to-day with regard to genera. A more exact knowledge of species also has rendered imperative a critical revision of all the older extra-European records, but in the case of the algæ, at all events, changes due to this cause are not numerous in the Magellan region.

Between Hooker's time and the French Expedition to Cape Horn in 1882, little additional knowledge of the cryptogamic botany of our area was obtained. The Falkland Islands material distributed in Hohenacker's well-known exsiccatæ was obtained by Lechler, who visited these islands as well as the Magellan Straits in 1850 and 1852. Both algæ and lichens are represented. The British Museum herbarium possesses a collection of marine

algæ obtained by Captain Abbott in 1859 mostly from Port Stanley. This officer, Mr. Vallentin informs me, was stationed for some years at Stanley in charge of a detachment of troops. He spent much time in the study of the fauna of the East Falklands, and was the author of several papers on the birds of the islands. His algal collection was named by Agardh, but no list was published. The 'Nassau' Hydrographic Expedition (1866–69) touched at the Falklands in 1867, and Cunningham, naturalist to the expedition, refers in his narrative to the flowering plants of the islands and also to "the gigantic seaweed *Lessonia fuscescens*" ('71, p. 156). He collected a few algæ and lichens, which are now at Kew, the latter being dealt with in a paper by Crombie ('76). Naumann, who accompanied the German 'Gazelle' Expedition (1874–76), also collected various cryptogams in the Magellan region, the determinations of which appear in the botanical reports of the voyage (Engler, '89). The Falkland Islands were, however, not visited.

The account of the 'Challenger's' stay at the Falklands will be found in the 'Narrative' (vol. i. part 2, pp. 883–901). The Kew herbarium shows that a few lichens and fungi were collected, though not apparently reported on.

Hariot's memoirs on the botanical collections of the French Mission to Cape Horn (1882–83), though not immediately concerned with the islands under notice, form a most useful and important contribution to our knowledge of the flora of the whole Cape Horn region. M. Hariot, who accompanied the expedition, collected plants of all kinds, and himself published the account of the algæ and fungi ('89), giving at the same time a chronological summary of previous work for both these groups and also for the lichens. He incorporated in his own papers previous records, and includes the Falkland Islands in his distributional notes. The section on lichens by Müller Arg. ('89) is, on the other hand, confined to the material collected by the expedition.

About this date several important cryptogamic papers appeared, which, though not dealing with the Falkland Islands themselves, should be consulted in any work connected with this geographical region. Of these, the lists by Nylander ('88) and by Müller Arg. ('89) of the Lichens of the Magellan neighbourhood should be mentioned, also Spegazzini's lengthy paper on the Fungi of Fuegia ('87), and Reinsch's report ('90) on the marine Algæ of South Georgia. Malme's account of the Stictaceæ of Patagonia ('99) is likewise worthy of attention. A paper by Svedelius ('00) on the Chlorophyceæ of the Magellan Straits should also be noted, especially as his records are not included in Gain's table of South-American algæ ('12, p. 117).

Mr. Rupert Vallentin turned his attention to the Falkland Islands algæ in 1898, when he sent home a small collection from Port Stanley. This was named by Mrs. Gepp, and is to be found in the British Museum herbarium.

A few lichens were received at Kew a short time previously to this from Mr. A. Linney, gardener at Government House, Port Stanley, and also from Miss Firmin from the Western Islands. Mr. A. W. Hill touched at the Falklands on his return voyage from the West Coast of South America in 1902, and amongst other plants collected were a few algæ and two specimens of Uredineæ.

Of the numerous recent Antarctic expeditions, the collections of which have been worked out, only one is directly concerned with the Falklands, namely the Swedish Polar Expedition of 1901–3. Magellan plants were, however, collected by the first Swedish Expedition (1895–97) and also by the Belgian Expedition ('Belgica,' 1895–97), whilst the South Orkneys and Gough Island were explored by the Scottish National Antarctic Expedition ('Scotia,' 1902–4). Both the French expeditions, the 'Française' (1903–5) and the 'Pourquoi Pas' (1908–10), confined their collecting almost entirely to the Graham Land region, and the German South Polar Expedition of 1901–3 ('Gauss') visited Kaiser Wilhelm's Land; whilst the three English expeditions, the 'Southern Cross' (1895–1900), the 'Discovery' (1901–4), and the 'Nimrod' (1907–9), all proceeded *viâ* New Zealand or Tasmania to Victoria Land. It should, however, be mentioned that as a result of the 'Pourquoi Pas' collections two valuable memoirs of wide scope have appeared. M. Gain, naturalist to the expedition, not only gives an account ('12) of his own collections of marine algæ, but also valuable summaries of previous work in the Antarctic regions; while Dr. M. Lemoine, who worked out the Lithothamnia, has provided what is practically a critical monograph ('13) of all the antarctic Melobesieæ.

In the results of the second Swedish Expedition (1901–3), on the other hand, the Falkland Islands figure largely. This is greatly owing to the fact that much of the material from other localities was lost with the ill-fated 'Antarctic.' Dr. C. Skottsberg with his indefatigable zeal had amassed large quantities of plants from South Georgia, Falkland Islands, Fuegia, and Graham Land, including, he states, "überraschende Dinge aus dem eisigen Meere." Three papers dealing with cellular cryptogams have been published—namely, Skottsberg's report on the Phæophyceæ ('07), which includes besides the description of several novelties the results of his morphological and anatomical investigations, Darbishire's account of the lichens ('12), and Carlson's paper on the fresh-water algæ ('12). Darbishire's paper gives summaries and tables of antarctic and subantarctic lichens, and it has been of great service in working out Mrs. Vallentin's collections. In Carlson's 'Süsswasseralgen aus der Antarktis' we have the first and only account for our archipelago of the algæ in question. From it the Falkland Island records have been picked out for the present paper, and they are given in a special list after the marine algæ.

Mrs. Vallentin's collections were made subsequently to the Swedish Expedition, but, unlike that and all previous explorations, the collecting was

carried out entirely in the wild and lesser-known West Falklands. The foliaceous lichens of this region are particularly fine and abundant. As will be shown later, Mrs. Vallentin's collections provided not only many additional records and several novelties, but also give for the first time a clear idea of the fungus flora of the islands. Since her plants were worked out, a small set of marine algæ providing several items of interest and a few additional names has been examined. This collection was made by Miss F. J. Hennis in West Point Island in 1911, and was sent to Kew on loan.

2. Floristic Notes.

The cryptogamic flora of the Falklands is from a geographical standpoint the same as that of Fuegia, the difference of its character—shown in the absence of many species—being due to habitat-conditions, such as the lack of mountains, the absence of woodland, and the consequent severe exposure to wind. Amongst the Phanerogams there are a number of endemic species, 15 are listed by Skottsberg, but this does not appear to be the case with the light-spored cryptogams. To the complete lack of trees must be attributed the absence of many lichens and also the wood-loving fungi, though with regard to the former, owing probably to many forms being adapted to bleak conditions, the list includes a large number of foliaceous and fruticulose species, and some of these occur in profusion. The marine algæ (though behind Fuegia in point of numbers) are in agreement with the view expressed above. The conditions necessary for their growth are practically the same in the two areas; hence, though each possesses species not so far found in the other, the flora is essentially one. For these reasons there is no need to draw comparisons between the two areas; further particulars can be obtained by consulting the lists in the present paper and the various Fuegian and Magellan enumerations which have been published.

A few remarks on the Falkland flora as represented by each group of the Thallophyta are given below, the total number of species listed for the respective groups being as under:—

Marine algæ	148
Fresh-water algæ . .	53
Lichens	75
Fungi	33

(a) *Marine Algæ.*—The proportions of the various groups are as follows:—

Cyanophyceæ . . .	4
Chlorophyceæ . . .	25
Phæophyceæ	41
Florideæ	78
	148

Of these, 19 are additions to the previous list and 3—*Endoderma maculans*, *Pteridium Bertrandii*, *Epilithon Vallentinæ*—are new species. On the other hand, it has been possible to remove from the older lists 12 names as erroneous records or synonyms of other species.

In the Chlorophyceæ the presence of 4 members of the Siphoniæ (2 species each of *Codium* and *Bryopsis*) is noteworthy in a flora having a well-marked subantarctic facies. In the Browns the Dictyotaceæ are, as might be expected, entirely absent. Amongst the larger species the dominant algæ are *Macrocystis* and species of *Durvillea*, *Lessonia*, and *Desmarestia*, these taking the place of the Fucaceæ and Laminariaceæ of the northern seas. Some notes on the Kelps by Mrs. Vallentin will be found on p. 141. The Florideæ exhibit special luxuriance. Not only do we find the huge fronds of *Gigartina radula* and *Iridæa laminarioides*, but amongst the delicate *Nitophylla* and *Delesseriæ* many large and very beautiful species occur. The most abundant red algæ, in addition to the two above mentioned, are *Callophyllis fastigiata*, *C. variegata*, *Plocamium secundatum*, *Glossopteris Lyallii*, *Ptilota magellanica*, *Polysiphonia* spp., *Plumaria Harveyi*, *Ballia callitricha*, and the ubiquitous *Ceramium rubrum*. *Lithothamnia* are frequent, but members of the Corallinæ-articulatæ, though represented by several species, are scarce.

(b) *Fresh-water Algæ*.—According to Carlson's list, the different groups figure in the following manner :—

Myxophyceæ	6
Bacillariales	36
Heterokontæ	1
Chlorophyceæ	10
	—
	53

In the case of the Diatoms the above figures include also brackish and marine species, but in the Myxophyceæ and Chlorophyceæ the few marine species dealt with by Carlson are not taken into account in the above table.

(c) *Lichens*.—No new species were obtained, but 6 names have been added to the existing list.

It would appear from Mrs. Vallentin's collection that the large foliaceous and fructiculose species are more plentiful in the West Falklands than in the East. *Parmelia lugubris*, for instance, is extraordinarily abundant ; and two very fine species of *Sticta* (*S. endochrysa* and *S. Freycinetii*), found in several localities by Mrs. Vallentin, were not noted at all by Skottsberg. The same is the case with several Cladonias. In these and in other instances many of the species were gathered in the eastern islands by Hooker and the early collectors ; and the fact that they were not found by Skottsberg

perhaps shows that since those days the larger lichens have been reduced in numbers, though in the western islands they still flourish.

(d) *Fungi*.—Of the 36 species now known from the Falklands, 22 or almost two-thirds are additions to the Falkland Island list, and of these 6 are described for the first time. Out of the total, about 15 are conspicuous macroscopic species, the remainder are small parasites or epiphytes. Being a treeless archipelago, the woodland species of Fuegia are absent.

The coloured drawings of fungi by Mrs. Vallentin supply us with a vivid picture of the terrestrial fungus flora. In the grassy valleys between the mountain-slopes there are, at certain seasons, a considerable number of small Agarics. The genera are clearly those of the pastures and moorlands of Northern Europe, but the question of species is very much more difficult. Even in a country such as England, where the possibilities are known, it is no easy matter to name members of Agaricaceæ from drawings and spirit-material. The characters are based on such unsuspected features that the artist usually needs the specialist's help to be enabled to portray them. It is not surprising, therefore, that some of the fungi depicted by Mrs. Vallentin have had to remain unnamed. On the other hand, several interesting pasture species have been recognised, including *Agaricus campestris*, *Lepiota granulosa*, *Mycena polygramma*, several Puffballs, and *Cordyceps militaris*; the pyrophilous Discomycete *Plicaria leiocarpa* may also be mentioned. In dealing with extra-European collections it has in the past often been the custom, and sometimes with good reason, to describe unrecognised species as new. But the more Mrs. Vallentin's specimens were studied, the more the resemblance to our British forms was apparent, though at the same time there was great difficulty in stating their specific identity. See also remarks on p. 157.

3. Phytogeographical Considerations.

A few words may first be said on the phytogeographical divisions, and on the data available for comparison. Although the terms "antarctic" and "subantarctic" have been used by botanists in various ways, most writers are agreed in including the Falkland Islands in the antarctic region in its widest sense. In the following remarks I have followed Gain ('12), who, for botanical purposes, places his antarctic boundary at 60° S., instead of the geographical 67°, and defines the subantarctic region as the area below that latitude in which the action of ice is felt. According to this method, Graham Land, the South Orkneys, and South Shetlands find a place, together with the lands within the actual polar circle, in the Antarctic Region ; whilst Fuegia, the Falklands, South Georgia, Bouvet, Crozets, Kerguelen, Marion, Possession, Campbell, Auckland, and Macquarie Islands fall into the Subantarctic Region. It will be noted that the northern boundary of this

subantarctic zone is irregular and does not follow a parallel of latitude. In longitude 60° E. it occurs at about 45° S. ; in South America, where the Straits of Magellan form the boundary-line, it is 53° S. (See map in Gain, '12, p. 106.) In spite of this, however, Fuegia and the Falklands are less affected by ice than the other localities.

Madame Lemoine in her paper on the 'Pourquoi Pas' Melobesieæ ('13) adopts the same northern boundary, but does not distinguish a subantarctic division, the whole area within the limit of floating ice being termed by her the "Antarctic Region." This she divides by longitude, and distinguishes three regions corresponding to the continents or oceans with which the islands are more or less connected, namely, South American (or South Atlantic), South Indian, and South Australian. These divisions are convenient both from a geographical and also from a botanical standpoint, and they will be adopted in the present survey of the cryptogamic flora, though we will maintain at the same time the antarctic and subantarctic regions as defined above.

In considering the relationships of the cryptogamic flora of our islands, it is the marine algæ which will come most prominently before us. Compared with the other groups, these have been both more largely collected and more carefully studied. The lichens follow, and in the case of Fuegia and Kerguelen are well known. For the fungi, on the other hand, few data are available. On wind-swept islands fleshy species are scarce and few collectors have searched for microscopic forms, which, even were they known, are not yet of much value for comparative purposes.

With regard to the three divisions of the subantarctic region, the Southern American is easily first, and, except for microscopic species, we have now a tolerably thorough knowledge of all cryptogams from this area. Lengthy lists of Magellan plants have been published, though in several genera considerable revision is necessary. The same cannot be said of the South Indian or South Australian divisions ; indeed, the need of further material from these areas, and the necessity of a thorough revision of the older records, has been very evident during the working out of the present collections. Of Kerguelen, it is true, our knowledge has increased of late, and Laing's paper ('09) has helped with regard to the algæ of the New Zealand subantarctic islands, but very many plants doubtless remain to be detected and numerous obscure points need to be cleared up.

The following remarks therefore deal only with the broad outlines, and not exact statistics. So far as the Falkland Islands themselves are concerned, the lists should be fairly correct. In the case of the marine algæ an effort was made, by means of the examination of original material and of type-specimens, to bring about this end, and to a lesser extent the same applies to the lichens and fungi.

A. Marine Algæ.—In comparing subantarctic floras we find that not only have these been more thoroughly investigated, but, at the present at all events, they offer greater scope. Many of the large and showy Florideæ are restricted in their distribution, and hence a greater variety is found in the different parts of the whole region (*cf.* Lichens, p. 156). This may be partly owing to the dispersal of spores being due to ocean currents, the influence of these in bringing about a wide distribution being less effective than wind. Yet this alone cannot be responsible, as we find that the three main groups of algæ differ amongst themselves in distributional range. This is shown in the following paragraph, where an attempt is made to give a general idea of the geographical components of the flora.

(*a*) *Analysis of Flora.*—As a general rule, the Green Algæ, if the Siphoneæ be omitted, show a larger proportion of cosmopolitan plants than either the Reds or Browns. Species of *Enteromorpha*, *Ulva*, *Cladophora*, *Rhizoclonium*, *Chætomorpha* very similar to each other occur all over the world, though they are more abundant in temperate regions. In the Falkland Islands nearly half the species have a sufficiently wide range to be regarded as practically cosmopolitan. Of the remainder, the majority, though these include several unsatisfactory species of *Cladophora*, are only known from the subantarctic American region. The most interesting plants are the members of the Siphoniæ, namely, *Bryopsis Rosæ* apparently endemic to subantarctic America, the widely distributed *Codium difforme*, and *C. mucronatum*, whose curious distribution is mentioned later (p. 165). *Prasiola crispa*, found in the colder and temperate regions of both the North and South hemispheres, is also worthy of note.

In the Brown Algæ we have out of 41 species only 3 which are cosmopolitan (*Pylaiella litoralis*, *Ectocarpus siliculosus*, and *Sphacelaria furcigera*), and 3 which flourish in both north and south temperate regions (*Phyllitis fascia*, *Scytosiphon lomentarius*, and *Desmarestia ligulata*); though to these should be added the doubtful record of *Punctaria plantaginea* and another possible cosmopolitan in the presence of *Colpomenia* sp. The remainder, with the exception of *Macrocystis* (and the somewhat doubtful *Chordaria*), are confined to the southern hemisphere, and a large proportion do not occur north of the subantarctic regions. A few extend to South Australia and New Zealand, and others, favoured doubtless by the Humboldt current, occur on the west coast of South America. The distribution of *Macrocystis*, which is shared to a large extent by *Iridæa cordata* and *Gigartina radula*, is interesting and instructive.

The Florideæ on analysis come out in very similar proportions to the Browns. About half out of 80 odd species are confined to the subantarctic or antarctic regions; others extend as far north as South Australia and New Zealand, or advance up the Chilean coast; whilst 10 or 12 are cosmopolitan or at least occur very widely in temperate regions. The cosmopolitan species belong to the genera *Porphyra*, *Ceramium*, and *Corallina*. *Gigartina radula*

and *Iridæa cordata* are abundant in the North Pacific, and the latter occurs also at the Cape.

It has been shown above (p. 148) that there is no need to examine the differences in the algal flora of the Falkland Islands and Fuegia, but a brief comparison with that of Kerguelen, the subantarctic islands of New Zealand, and also with the true Antarctic, though not throwing much light on the origin of these floras, brings out a few interesting points.

(*b*) *Comparison with Kerguelen* *.—This is the only representative of the South Indian division of the subantarctic, the flora of which has been at all satisfactorily investigated. The climate is decidedly colder than that of Magellan, as may be seen by comparing the mean monthly temperatures obtained by the 'Gauss' and Swedish Antarctic Expeditions. For this reason, as well as from its isolated position, the flora is, as might be expected, much poorer in species. As Hooker pointed out, it closely resembles the Fuegian and has no affinity with that of South Africa—it is, in fact, entirely subantarctic, though lacking a large number of species which are found in the Magellan region. From the presence of endemic phanerogams, 6 out of a total of 21, Werth ('11, pp. 361–5) does not favour Hooker's view that the flora immigrated from the west, and hence a more accurate knowledge of the marine algæ would be of great interest as bearing on this point. Kerguelen has several algæ not found in the Magellan area; 14 are listed by Gain ('12, pp. 128–132), but only six of these have any claim at present to be regarded as endemic, even if we include, as we may with fairness, two from Heard Island and Marion Island. The 14 species referred to are :—

Desmarestia chordalis.	*Delisea pulchra.*
(*Callophyllis tenera.*)	*Ptilota Eatoni.*
(*Callymenia dentata.*)	(*Rhodochorton Rothii.*)
Epymenia variolosa.	*Lithothamnium Kerguelenum.*
Plocamium Hookeri.	(*Scytothalia obscura*) (Heard Island).
(*Nitophyllum crispatum.*)	*Callophyllis elongata* (Heard Island).
Nitophyllum fuscorubrum.	*Cladhymenia pellucida* (Marion Island).

Of these, the 5 included between brackets may, for reasons explained in the footnote †, be disregarded. Of the remainder, *Desmarestia chordalis*, *Epymenia*

* Throughout this paper only large or fairly conspicuous species are used for comparative purposes, small species are too easily overlooked to be at present of value.

† *Callophyllis tenera.*—It is possible that *C. tenera* may be a synonym of *C. fastigiata*, but the 'Challenger' examples, on which the record was based, may certainly be taken as forms of that species, which is also common in the Falklands.

Callymenia dentata.—Record certainly incorrect, most of the specimens are *Rhodymenia palmata.*

Nitophyllum crispatum.—A very doubtful record. Other species might easily be mistaken for this, which at present is only known from Auckland and Campbell Islands.

Rhodochorton Rothii.—The Kew specimens are epiphytic on *Ahnfeltia*, and certainly distinct from this northern species. Possibly new and undescribed.

Scytothalia obscura.—A very doubtful plant, based on a single and young specimen.

variolosa, *Nitophyllum fuscorubrum* (see note, p. 201), and *Lithothamnium kerguelenum* (see Lemoine, '13, p. 8), are at present only known from Kerguelen, and the last two on the list only from the islands mentioned. *Plocamium Hookeri* is very frequent on Kerguelen, and has been found elsewhere in South Georgia and at Macquarie Island. *Ptilota Eatoni*, also a common Kerguelen species, has lately been recorded from Graham Land. The most interesting species is undoubtedly *Delisea pulchra*, which gives another link with Australia. Its headquarters are in New South Wales and New Zealand, though it has not been collected from the subantarctic islands of that continent. It was collected at Kerguelen by Hooker and also by the 'Challenger' Expedition. When better known it is possible that the plant may prove to be a distinct subantarctic species, but, in any case, the affinities of the genus are Australian rather than South American.

The number of Falkland species absent from Kerguelen is, on the other hand, considerable, as will be seen from the following list :—

Codium mucronatum.
Bryopsis Roseæ.
Corycus prolifer.
Phyllitis fascia.
Stictyosiphon Decaisnii.
Gelidium crinale.
Catenella Opuntia.
Acanthococcus spinuliger.
Schizoneura Davisii (see p. 185).
Chondria sp.
Lophurella comosa.
Bostrychia Hookeri.
Bornetia antarctica.
Callithamnion Montagnei.
Plumaria Harveyi.
Ballia scoparia.
Antithamnion flaccidum.
Hildenbrandtia Cannelieri.
Corallina officinalis.
Corallina pilulifera.
Amphiroa spp.

(*c*) *Comparison with Australian Region.*—An immense advance in our knowledge of the fauna and flora of this region of the subantarctic may be expected from the results of the collections made at the station established by the Australian Antarctic Expedition on Macquarie Island. Meanwhile, we have the two valuable volumes, edited by Chilton, entitled 'The Subantarctic Islands of New Zealand' ('09), which give summaries of the flora so far as at present known. The report by Laing on the marine algæ ('09) is the most complete of any on the cellular cryptogams. On examining his list one is struck immediately by the large number of species which belong to New Zealand and even Australia, and the small percentage of Fuegian or circumpolar forms. This is partly to be accounted for by the fact that most of the records are from the Aucklands group, and that from Campbell and Macquarie Islands (the only ones within the summer limit of icebergs) much fewer algæ have been collected *.

* It should, however, be stated that, according to the map provided by Chilton, Kerguelen also is outside the summer limit of icebergs.

But even if the Campbell Island list be analysed (Macquarie may be omitted, as not more than 2 or 3 algæ have been recorded), a number of very marked New Zealand types are present, and at a liberal estimate (though excluding cosmopolitans) only half the number of species can be regarded as circumpolar. As the list is admittedly very incomplete and also in need of revision, it is not worth while giving the full analysis, but it may be stated that, apart from *Durvillea antarctica*, *Adenocystis utricularis*, *Scytothamnus fasciculatus*, *Desmarestia Willii*, *Heterosiphonia Berkeleyi*, and *Ballia callitricha*, with *Macrocystis*, *Iridæa cordata*, and *Gigartina radula* of wider range, there are, excluding cosmopolitans, few species which can at present be stated to occur both in Fuegia and the subantarctic islands of New Zealand. From our present standpoint no region is in greater need of investigation than Macquarie, and the results of Sir Douglas Mawson's expedition are awaited with great interest.

(*d*) *Comparison with Antarctic Region.*—Amongst the many tables furnished by Gain ('12) is one showing the algal distribution in the antarctic and subantarctic regions. He lists 70 species for the former and distinguishes 3 elements—endemic, circumantarctic, and foreign,—by means of which he analyses the whole. Gain's table gives a full and clear idea of the distribution of the species in the different islands. The present paper, not being concerned with that area, throws little additional light on the subject except to show that of Gain's endemic species two may be removed from the list, namely, *Monostroma endiviæfolia* and *Callymenia antarctica*, as these are now recorded as occurring in the Falkland Islands.

On proceeding south from Cape Horn, a marked change comes over the flora. Of the 140 species listed for the Falklands, less than a quarter have been recorded for S. Shetlands, S. Orkneys, or Graham Land, whilst of the 65 species known from the latter areas not much more than half occur in the Magellan region. No doubt many algæ in the antarctic remain to be discovered, and not a few records require verification, but it is evident that the Graham Land flora is very distinct from that of Cape Horn, though there are many common species. How far the floras of Graham Land and Victoria Land correspond we are not yet in a position to say.

(*e*) *Summary.*—From the above comparisons, it will be seen that the algal flora of the Magellan region is a subantarctic one of a distinct South American type. Many of the species composing it appear to be confined to subantarctic America ; a large number are also found in the South Indian region of the subantarctic of which Kerguelen is typical, and a small proportion only are known from the subantarctic islands of New Zealand. In the same way we find that the algal flora of the latter islands has a distinct stamp, a very marked New Zealand element manifesting itself in both genera and species. The affinity of Kerguelen, which lies between, is American, but, in addition to the subantarctic American species, it possesses

some half-dozen large Florideæ not known from elsewhere and two species, absent in Fuegia, but found in New Zealand or its subantarctic islands.

The number of circumpolar species (excluding cosmopolitans) in the subantarctic region is, as far as we know at present, not great, but in higher latitudes, *i. e.*, in the Antarctic region proper, greater uniformity in the flora may be expected. Writing of the phanerogamic vegetation, Dr. W. B. Hemsley says in his report on insular floras for the 'Challenger' expedition, "the only admissible demarcation of the coldest floral region is a zonal one." This is most probably true also in the case of the algæ. But in the subantarctic, the floras of the eastern and western areas we have been considering are very distinct from each other, and are markedly related to those of New Zealand and South America respectively.

B. Fresh-water Algæ.—No attempt has been made to give a comparative survey of the subantarctic fresh-water algæ, as this can only be done by a competent specialist. In any case there is little data available, and all the older records require revision. The valuable papers by Fritsch ('12, '12 *a*, '12 *b*) and West and G. S. West ('11) deal with the Antarctic proper, but they are of interest in connection with Carlson's South Georgia and Falkland Islands lists ('13). Gain's tables ('12) should also be consulted.

C. Lichens.—With regard to lichens the widespread distribution of many of the larger species is well known, and this is very noticeable in the case of the Falkland Island flora. Out of the 75 species listed nearly half are so widely spread, most in hilly and alpine districts, as to be regarded as cosmopolitan. The fact that some are known from all continents, except Australia, probably implies nothing further than the fact that the mountainous regions of that continent have not yet been thoroughly searched. But in some genera this universal distribution does not obtain. Of the seven members of the Falkland Islands Sticteæ, for instance, five are confined to the southern hemisphere; in the genus *Placodium*, the new species lately described tend to show that some species are decidedly limited in their range, whilst in the small crustaceous species world-wide distribution appears to be the exception rather than the rule.

Darbishire has already given tables dealing with the distribution of the antarctic and subantarctic lichens, and his geographical observations ('12, pp. 61–66) are of interest in connection with the Falkland Islands lichen-flora. With regard to the subantarctic American region he compiled a list of 366 species, and these he analyses and compares with the New Zealand flora as follows:—

	Fruticulose.	Foliose.	Crustaceous.	Total.
Subantarctic American Species. . .	73	99	194	366
Found also in New Zealand	52 % (38)	35 % (35)	20 % (39)	31 % (112).

These figures show that the floras of the two regions have somewhat in common, and the affinity is largely amongst the fruticulose forms.

In a general way the wide distributional range of lichens must be attributed to the general dispersal of their spores by wind and to their hardy nature, their power of enduring cold and desiccation being well known to be remarkable (*cf.* Fungi, p. 158). Why it is that widespread and cosmopolitan species are much more numerous amongst fruticulose forms is not at all clear. Darbishire remarks with regard to this point:—"The fruticulose species are the oldest and probably least variable at present. The crustaceous species are more variable and have adapted themselves more to local conditions, thus giving rise to new species" ('12, p. 63). The human factor also is no doubt, as Darbishire allows, partly responsible, the minute size of many crustaceous plants making them easily overlooked and more difficult to identify from any book-descriptions.

The Kerguelen flora, which was not touched upon by Darbishire, shows on comparison two interesting features. In the first place, the scarcity of fruticulose and foliaceous plants is very noticeable. In Zahlbruckner's list, which is the most recent and, excluding Crombie's papers, the only one critical, this is exceedingly marked, only 1 *Cladonia*, 1 *Sticta*, 1 *Parmelia*, and 2 *Usneas* out of a total of 43 being recorded. Hooker and Taylor enumerated a few other large species, as did Crombie, but there is some doubt as to the earlier records (*vide* Crombie, '76, p. 180). The bleakness and barrenness of Kerguelen is well known, but with so many fructiculose and bulky foliaceous species in the Falklands (amongst others, 13 *Cladoniæ*, 7 *Stictæ*, 6 *Pameliæ*, 5 *Usneæ*) so small a number in Kerguelen is rather surprising.

The second feature is the floristic difference noticeable amongst the crustaceous species of the two areas. With the exception of the cosmopolitan *Rhizocarpon geographicum*, not one crustaceous species recorded by Zahlbruckner has been found in the Falklands, and very few are listed by Darbishire for Fuegia. The time has not yet come for drawing conclusions based on such small species, but it would certainly appear that the lichen-flora of Kerguelen has not much in common with subantarctic America. The permanently saturated soil of Kerguelen is probably unfavourable to the growth of foliose species, and the Falklands have the advantage of proximity to the mainland, by means of which the flora, through reproductive bodies brought over by the prevailing westerly winds, may be constantly renewed.

D. Fungi.—Little can be said with regard to this group in other parts of the subantarctic. Hennings ('06) has given a careful account of the Kerguelen material brought back by the 'Gauss,' and this may be compared with the Falkland Islands and Magellan lists. The lists, however, consist mostly of micro-species, and it is evident that our knowledge is very imperfect.

If compared with Europe we may safely say that the terrestrial fungus-flora of the Falklands must in a general way resemble that of our own islands. The genera are the same. Small species of *Tricholoma*, *Hygrophorus*, *Mycena*, and *Omphalia* are common, whilst amongst the pink and yellow spored sections species of *Entoloma*, *Galera*, and *Naucoria* are evidently frequent. The coprophilous (dung-loving) fungi are, as far as they have been investigated, identical with those of Europe; *Stropharia semiglobata*, *Coprinus radiatus*, and *Ciliaria stercorea* being common, and agreeing exactly in form and microscopic structure. The specific identity of the pasture-forms is exceedingly difficult, but, as stated above, several well-known British species are recognisable (see p. 150), and further work will doubtless reveal others. At the same time a definite South American type, if we may judge from the numerous new Agarics described by Spegazzini from Fuegia, is recognisable in the Magellan region. In the Falklands, however, this element, though obvious enough amongst the smaller and parasitic species, is not apparent in the pasture-species list at present available.

Contrasted with lichens, fungi may be said to be less hardy and less widely distributed. Many of the former can endure great extremes of temperature and also severe desiccation, and they must rank amongst the most widely distributed of all plants. Not a few lichens, moreover, occupying sea-level in cold and temperate countries are found in the mountainous regions of S. Europe, and at greater elevations on the Himalayas and mountains of Africa; and probably most of the species common to the Arctic and Antarctic occur, with a break at Panama, down the whole backbone of America. As far as is known, this is not the case with the fungi, the flora of the tropics being very different from that of Europe, though it should be noted that, as a rule, it is only the woody or coriaceous species that are forwarded or brought home for examination. In temperate S. America (Patagonia, the Argentine, and Paraguay) Spegazzini has collected and described many fleshy Agarics. Some of these he refers to already described species, but a large number he describes as new. The occurrence, therefore, of British species in the Falkland Islands tends to confirm the view that the light spores of the cellular cryptogams are universally distributed, and that the plants will flourish where conditions are suitable.

With regard to the parasitic and epiphytic fungi specialization is rather marked, several distinct rusts and other species occurring on various native plants in the Magellan area (see p. 224, and Spegazzini, '87, pp. 46–53). At the same time it is interesting to note the presence of the well-known *Puccinia Violæ* on *Viola maculata*, and *Cystopus candidus* on the endemic Crucifer *Arabis macloviana*.

From an ecological standpoint the fungus-floras of the subantarctic islands, when more thoroughly known, may well be compared with such treeless islands as Iceland and the Faroes in the North Atlantic, for both of which

Rostrupp has provided fairly lengthy lists ('03 and '03 *a*). Leege's papers on the flora of the East Frisian Islands, and Rea and Hawley's report ('12) for the Clare Island Survey are also of interest in this connection, the last-mentioned giving a list of important genera found on the mainland, but absent on Clare Island only three miles distant. As in the Falklands, the explanation is doubtless chiefly to be found in the severe exposure and the absence of trees.

II. SYSTEMATIC LIST OF MARINE ALGÆ.

CYANOPHYCEÆ.

Dermocarpa prasina, *Thur. et Born. Notes Algol.* ii. pp. 75–77, tab. 26.
E. Falklands; Berkeley Sound, *Hooker*; Port Stanley, *Hohenacker*. W. Falklands; Roy Cove, *Vallentin*.
Distrib. Cosmopolitan.

Hyella cæspitosa, *Born. et Flah. in Journ. de Bot.* ii. (1888) p. 162.
W. Falklands; in *Spirorbis*, Roy Cove, *Vallentin*.
Distrib. Probably cosmopolitan.
One of the shell-boring algæ, and not previously known from the Falklands.

Oscillaria nigro-viridis, *Gom. Oscill.* p. 237, tab. 6. fig. 20.
E. Falklands; Port Louis, *Skottsberg*.
Distrib. Probably cosmopolitan.

Calothrix æruginosa, *Thur. Ess.* p. 382; *Born. et Thur. Notes Algol.* ii. p. 157, pl. 37.
E. Falklands, *Bérard* (teste *Bornet*), *Hooker* (teste *Hariot*).
Distrib. Probably cosmopolitan.

CHLOROPHYCEÆ.

Chlorochytrium inclusum, *Kjellm. Algæ Arctic Sea*, p. 320.
W. Falklands; in *Iridæa cordata*, Rapid Point, *Vallentin*.
Distrib. N. Atlantic, N. Pacific, Fuegia.
With the exception of Hariot's record from Fuegia, this alga has not apparently been detected from elsewhere in the southern hemisphere.

Monostroma endiviæfolia, *A. & E. S. Gepp, in Journ. Bot.* xliii. (1905) p. 105, tab. 470. figs. 1–5; '*Scotia*' *Report*, iii. p. 73, pl. 1. figs. 1–5.
E. Falklands; Port William, *Hooker*. W. Falklands; West Point Island, *Hennis*; Roy Cove, in pools at half-tide, *Vallentin*.

Distrib. South Orkneys, Falkland Islands.

The present is the first record of *Monostroma* for the Falklands, and it is a genus apparently rare in subantarctic regions. *M. endiviæfolia*, though previously only known from the original locality, has probably in the past been mistaken for young plants of *Ulva*. A specimen of Hooker's inscribed "*U. rigida?*" exists at Kew, and this shows a distinct *Monostroma* structure and almost certainly belongs to the present species. Miss Hennis's specimen is larger and more laciniate than previous gatherings.

Ulva Lactuca, *Linn. Sp. Pl.* ii. p. 1163, *ex parte*.

Falkland Islands, general, all collectors.

Distrib. Cosmopolitan.

Each of the three varieties, or forms, *genuina*, Hauck, *rigida*, Le Jolis, and *latissima*, Ardiss., appear to be present, the last-named being, according to Hooker, abundant in land-locked lagoons.

Enteromorpha intestinalis, *Link, in Nees Hor. Phys. Berol.* 1820, p. 5.

Falkland Islands; probably general, *Hooker*, *Vallentin*.

Distrib. Cosmopolitan.

E. compressa, *Grev. Alg. Brit.* p. 180 (excl. var.).

Falkland Islands, most collectors, "very abundant," *Hooker*.

Distrib. Cosmopolitan.

Hooker included the following species, which is hardly distinct, under this name, hence *C. compressa*, though doubtless common, is perhaps not quite so abundant as he supposed.

E. Linza, *J. Ag. Till Alg. Syst.* vi. p. 134.

E. Falklands; "abundant," *Hooker*. W. Falklands; Shallow Bay, *Vallentin*; West Point Island, *Hennis*.

Distrib. Cosmopolitan.

Hooker's specimens have not been found in the Kew Herbarium. Mrs. Vallentin collected several plants, which are apparently referable to this species, but they approach very closely to the flattened tapering forms of *E. intestinalis*.

E. bulbosa, *Kütz. Sp. Alg.* p. 482.

E. Falklands; Berkeley Sound, *Hooker*. W. Falklands; Shallow Bay, *Vallentin*.

Distrib. Chile, Peru, Kerguelen, Cape, Tasmania.

Kützing detected this form amongst Hooker's Berkeley Sound specimens, and named it *E. Hookeri*; later it was shown to be a synonym of Suhr's *Solenia bulbosa*.

Enteromorpha clathrata, *J. Ag. Till Alg. Syst.* vi. p. 153, *sensu lat.*
W. Falklands ; Shallow Bay, *Vallentin.*
Distrib. Cosmopolitan.
It is curious that this generally distributed plant should not have been previously collected on the islands.

Prasiola crispa, *Ag. Sp. Alg.* p. 416. *Ulva crispa*, Lightf. ex Hook. f. et Harv. Fl. Ant. p. 498.
E. Falklands; Berkeley Sound, *Hooker.*
Distrib. Arctic and temperate regions of Europe, Asia, and Africa; Antarctic.
Fritsch ('12 *a*, p. 127, '12 *b*, p. 17) has dealt with the occurrence of this plant in antarctic regions, and he gives a useful account of the relationships of allied forms. The alga is a brackish and fresh-water species, and its growth is favoured by ammoniacal pollution. In Northern Europe it is often found in fine condition on the rocks below bird-colonies on sea-cliffs. In the Antarctic no data appear to have been given with regard to its habitat, but the presence of numerous small feathers amongst the "Scotia" specimens from the S. Orkneys is highly suggestive. Letts ('13) gives an account of experiments carried out with regard to its powers of absorbing ammonia (see Bot. Centralbl. Bd. cxxv. p. 298).

Endoderma maculans, *Cotton*, sp. nov. (Pl. **6**. figs. 1 & 2.)
Frondes endophyticæ maculas orbiculares 0·5–1 cm. diam. formantes, interdum confluentes. Thallus e filamentis articulatis ramosis deinde centro in stratum pseudoparenchymaticum concretis compositus. Filamenta radiantia plus minusve porrecta e cellulis 8–12 μ, diam. 2–3-plo longioribus? Cellulæ strati pseudoparenchymatici irregulares, angulatæ vel rotundatæ, 15–20 μ diam., in sporangia mutatæ. Sporangia irregularia 20–30 μ longa, sporis globosis numerosis (16–32 ?) 3–4 μ diam.
W. Falklands ; in frondibus *Nitophylli* sp., Shallow Bay, *Vallentin.*
The above new species occurred in abundance in a large sterile frond of an indeterminable species of *Nitophyllum*. It differs from *E. viride*, var. *Nitophylli*, Cotton, in the decidedly larger cells of the filaments, which also, for the most part, radiate across the cells of the host instead of following the outline of the cell-walls (*cf.* Pl. **6**. fig. 1, and Journ. Linn. Soc. xxxvii. pl. 12. fig. 1). A much larger amount of pseudoparenchyma is, moreover, developed in the present species, and in this sporangia arise in abundance (Pl. **6**. fig. 2).

Urospora penicilliformis, *Aresch. Obs. Phyc.* i. p. 15.
Falkland Islands, teste *Gain.*
Distrib. N. temperate and Arctic regions, Fuegia (?), Kerguelen.

Gain gives this species in each of his lists as occurring in the Falkland Islands, but I have found no published record of the fact. It has, however, been recorded from other parts of the subantarctic.

Rhizoclonium pachydermum, var. maclovianum, *Carlson, Süsswasseralgen aus der Antarktis*, p. 53, fig. 19.

E. Falklands; Port Louis, *Skottsberg*.

Distrib. Falkland Islands.

Distinguished from the type by the unicellular rhizoidal branches, which are usually bifurcate at the tip.

Cladophora falklandica, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 294; *Fl. Ant.* ii. p. 495, tab. 143. fig. 1.

E. Falklands; Berkeley Sound, St. Salvador Bay, *Hooker*.

Distrib. Falkland Islands.

C. flexuosa, *Dillw. Hist. Brit. Conf.* tab. 23.

E. Falklands; Berkeley Sound, teste *Hooker*.

Distrib. N. Atlantic.

C. gracilis, *Kütz. Phyc. Germ.* p. 215.

W. Falklands; Shallow Bay, at extreme low-water line, *Vallentin*.

Distrib. Throughout Europe, Atlantic coast of N. America, New Zealand, Tasmania (teste *Grunow*).

New to the Falkland area. The specimens are indistinguishable from those of southern England, and were procured from similar situations (*i. e.* quiet land-locked bays). *C. falklandica*, which is closely allied and may even be an extreme form, differs in the much shorter cells of the ultimate branches.

C. læte-virens, *Kütz. Phyc. Germ.* p. 214.

E. Falklands, *d'Urville*, teste *Hariot*. W. Falklands; Roy Cove, *Vallentin*.

Distrib. North Atlantic.

Two specimens collected by Mrs. Vallentin are doubtfully referable to this species.

C. subsimplex, *Kütz. Sp. Alg.* p. 41. *C. simpliciuscula*, Hook. f. et Harv. in Fl. Ant. ii. p. 496, tab. 142. fig. 4 (*non* Kütz.).

E. Falklands; Berkeley Sound, *Hooker*.

The name given by Hooker & Harvey was preoccupied, hence Kützing renamed the plant in his 'Species Algarum.'

CLADOPHORA ARCTA, *Kütz. Phyc. Gen.* p. 263.

E. Falklands ; Berkeley Sound, Port William, *Hooker.* W. Falklands ; West Point Island, *Vallentin, Hennis.*

DISTRIB. N. Atlantic, N.W. America, Fuegia, Kerguelen, South Georgia.

This species, around which in Northern Europe so many varieties and subspecies centre, is widely distributed in the subantarctic regions. The species was originally described by Dillwyn from Irish specimens, and on the Irish coasts numerous forms occur which pass imperceptibly into one another. Hence I regard with some misgivings the validity of most of the northern species which have recently been proposed, and likewise Kützing's *C. Hookeriana* from the Falkland Islands. Both Hooker's and Mrs. Vallentin's specimens are somewhat less dense than the commoner British forms, but they possess a copious supply of hooked branches and rhizoidal filaments. Gain ('12, p. 31) gives an interesting note on the structure of this species.

C. PACIFICA, *Kütz. Sp. Alg.* p. 419.

Falkland Islands, *Hohenacker,* no. 266.

DISTRIB. Auckland Island, Kerguelen, Fuegia.

See notes by Svedelius, '00, p. 295.

C. HOOKERIANA, *Kütz. Sp. Alg.* p. 418.

Falkland Islands, *Hooker.*

DISTRIB. Falkland Islands.

A form separated from *C. arcta* by Kützing. See note under that species.

C. CONFUSA, *Hariot, in Bull. Soc. Bot. Fr.* xxxviii. (1891) p. 417 (note). *C. Kuetzingii*, Hariot, Miss. Cap Horn, p. 20 (*non* Ardiss.).

E. Falklands ; Port Stanley, *Hohenacker.*

DISTRIB. Fuegia, Falkland Islands.

As his earlier name had been previously used by Ardissone, Monsieur Hariot re-named this species in 1891. In response to an enquiry he tells me that the full synonymy, according to Bornet, is as follows :—*C. confusa*, Hariot ; *C. Kuetzingii*, Hariot (non Ardiss.) ; *C. repens*, Kütz. in Hohenacker, no. 411 ; *C. refracta*, Kütz. et *C. complicata*, Kütz., in Hohenacker, no. 468 ; *Lychate tortuosa*, J. Ag. in Hohenacker, no. 253 ; *Rhizoclonium ambiguum* (Hook. f. & Harv.), Kütz. Sp. Alg. p. 387.

With regard to the last name given as a synonym, if this were correct a further change in nomenclature would have to be made, as Hooker & Harvey's name antedates all others. An examination of the type shows, however, that that plant is a true *Rhizoclonium* and not a *Cladophora,* hence it is not a synonym of Hariot's *C. confusa.*

Bryopsis plumosa, *Ag. Sp.* p. 448.

E. Falklands, teste *Hooker*.

Distrib. Recorded from all parts of the world, but many records require verification.

Most of Hooker's material is referable to *B. Rosæ*, and I am doubtful if any specimen can be identified with *B. plumosa* of Europe.

B. Rosæ, *Ag. Sp.* i. p. 450 ; *Hook. f. et Harv. in Fl. Ant.* ii. p. 492.

E. Falklands, *Hooker*. W. Falklands ; Shallow Bay, Roy Cove, *Vallentin* ; West Point Island, *Vallentin*, *Hennis*.

Distrib. Fuegia, Falkland Islands.

This species, which occurs so plentifully in the Falkland Islands and Magellan districts, was described by the elder Agardh in 1822, and, though closely allied to *B. plumosa* of Europe, it is usually regarded as a distinct species. The plant differs from *B. plumosa* in its larger size and more robust habit, but it is possible, as the authors remark in 'Flora Antarctica,' that it may be only "a large state of that very sportive species" (vol. ii. p. 492). They record, however, both species. A good series of spirit or formalin material is necessary if species of this genus are to be dealt with critically. Till the point can be definitely settled it is advisable to adhere to the old view. Part of the original gathering is to be found at Kew. It was collected by Gaudichaud about 1820, and was named after Rose de Freycinet, the heroic wife of the commander of the 'Uranie' expedition (see Oliver, '09, p. 210).

Codium difforme, *Kütz. Phyc. Gen.* p. 300.

W. Falklands ; Roy Cove, *Vallentin*.

Distrib. Mediterranean, Indian Ocean (Chagos Archipelago), Warmer Pacific (teste *Collins*), Kerguelen.

New to the Falklands. This plant has in the past been wrongly united with *C. adhærens*, and is presented thus in De Toni's 'Sylloge.' It resembles that species in habit, but differs in structure and also in geographical distribution. It is, on the whole, a rarer plant, and, with the exception of Hariot's ('89) record which may possibly concern *C. adhærens*, has not been previously recorded from this region. A specimen from Kerguelen also exists, being collected during the 'Challenger' expedition and found un-named in the Kew Herbarium. The utricles of *C. difforme* measure 1 mm. by 150–200 (rarely 300) μ and are much longer and larger than those of *C. adhærens*, as was pointed out by Kützing (Tab. Phyc. vi. fig. 99) and later by Askenasy & Bornet.

Codium mucronatum, *J. Ag. Till Alg. Syst.* viii. p. 43. *C. tomentosum*, Hook. f. et Harv. in Fl. Ant. ii. p. 491 (*non* Stackh.).

E. Falklands; Berkeley Sound, Port William, St. Salvador Bay, *Hooker*; Port Stanley, *Vallentin*. W. Falklands; Roy Cove, Shallow Bay, King George's Sound, on rocks near low-water line, *Vallentin*; West Point Island, *Hennis*.

Distrib. Australia, New Zealand, Fuegia. Pacific coast of N. America (var. *californicum*), Japan (?), Scotland, and Ireland (var. *atlanticum*).

This plant is evidently common in the Magellan region. Several specimens collected by various expeditions exist at Kew, and a fine series was brought home by Mrs. Vallentin. The alga was listed by Hooker as *C. tomentosum* and referred to by Hariot in 1889 as *C. fragile*, a Japanese species (or form?) to which it is very closely allied. It is, however, undoubtedly the same as J. Agardh's *C. mucronatum*, which was described three years previously from Australia and New Zealand, as, indeed, Svedelius has already pointed out ('00, p. 299). The Falkland Island material agrees for the most part with var. *Novæ Zelandiæ*, J. Ag., but two specimens approach very closely var. *tasmanicum*. Whether these forms are worthy of varietal names is questionable.

The discovery of *C. mucronatum* on the west coasts of Scotland and Ireland a few years ago was interesting and unexpected, since the plant is not known elsewhere in Europe. A fairly full account of its biology and distribution is given in the report on the Marine Algæ of the Clare Island Survey (Cotton, '12, pp. 114–119).

Ostreobium Queketti, *Born. et Flah. in Bull. Soc. Bot. France*, xxxvi. (1889) p. clxi, pl. 9. figs. 5–8.

W. Falklands, *Vallentin*.

Distrib. Europe, N. America, probably cosmopolitan.

Some very fine material, apparently indistinguishable from the European form, was found in some shells collected by Mrs. Vallentin in the West Falklands.

PHÆOPHYCEÆ.

Durvillea antarctica, *Hariot, in Notarisia*, vii. (1892) p. 1432. *D. utilis*, Bory in d'Urville, Flore des Malouines, p. 588; Hook. f. et Harv. in Fl. Ant. ii. p. 454.

E. Falklands, *Hooker*; Kidney Cove, *Skottsberg*. W. Falklands, *Vallentin*; Cape Meredith, *Skottsberg*.

Distrib. Chile (Magellan–Valparaiso), Fuegia, Falkland Islands, S. Georgia, Kerguelen, Tahiti (teste *Grunow*), New Zealand, Chatham Islands, Auckland Island, Campbell Island.

The correct name for this plant was first given by Hariot in 1892, a fact overlooked by Skottsberg.

"Dark myrtle-green in colour, occurring along the shores of the open ocean, where it appears to revel in the boisterous surf. During low-water spring tides, the long finger-like fronds are left stranded on the rocks, and on the return of the tide they afford a pretty sight being washed hither and thither by the waves."

Durvillea Harveyi, *Hook. f. in Lond. Journ. Bot.* iv. (1845) p. 249.
Falkland Islands, *Hooker*, *Skottsberg*. W. Falklands, *Vallentin*.
Distrib. Fuegia, Falkland Islands, S. Georgia (?), Kerguelen.
The following notes by Mrs. Vallentin are worthy of record :—
"The second species of *Durvillea*, *D. Harveyi*, flourishes in similar regions to the preceding and is similar in colour, but the fronds are broad and not split up to the same extent. The whole plant resembles rather a sheet of leather, and grows to a very large size. In the largest specimen we noted, which was washed ashore in King George's Sound, the stem when fresh measured 8½ inches in circumference, and the whole plant was so massive that I could not move it. I therefore fastened my horse to the stem and dragged it up above high-water mark. On spreading the fronds out on the turf, it was found to cover a space measuring 12 × 18 feet, the size of an ordinary sitting-room. The most striking feature about this plant is the strong, short stem, seldom, if ever, exceeding 6 inches in length, which is fastened to the sucker-like root by a kind of ball-and-socket joint, which allows the fronds to sway about in the waves (*vide* Pl. 6). The fronds of both species when dry present an appearance similar to honey-comb, and I am informed that the dried fronds of *Durvillea utilis*, when cleaned out, are used as water-bottles in some parts of the South American continent."

Adenocystis utricularis, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 39. *A. Lessonii*, Hook. f. et Harv. in Fl. Ant. i. p. 179, tab. 69. fig. 2; ii. p. 468.
E. Falklands; Berkeley Sound, *Hooker*; Port Louis, littoral pools and rocks, *Skottsberg*. W. Falklands; West Point Island, *Hennis*.
Distrib. Fuegia, Falkland Islands, S. Shetlands, S. Orkneys, Louis Philippe Land, Cockburn Island, S. Georgia, Kerguelen, Tasmania, New Zealand, Auckland Island, Campbell Island.
Gain ('12) gives a good account of this plant. He uses the more familiar name *A. Lessonii*, but, since Bory's *Asperococcus utricularis* antedates his *A. Lessonii* by two years, the combination employed by Skottsberg is correct.

Lessonia nigrescens, *Bory in Duperry*, *Voy. Bot. Crypt.* p. 80, tab. 5.
E. Falklands, *Hooker*; Port William, *Skottsberg*. W. Falklands; Roy Cove, in rock-pools, *Vallentin*.
Distrib. Peru, Chile, Fuegia, Falkland Islands, S. Georgia (?), Kerguelen, Heard Island, Tahiti (teste *Grunow*).

Lessonia flavicans, *Bory in d'Urville, Flore des Malouines*, p. 594 (1826); *Skottsberg, Subant. u. Ant. Meeresalgen*, i. p. 73, Taf. 7, text-figs. 89–90. *L. fuscescens*, Bory; Hook. f. et Harv. in Fl. Ant. ii. p. 457. *L. ovata*, Hook. f. et Harv. *l. c.* p. 459.

E. Falklands, *Hooker*; Berkeley Sound, Port Louis, *Skottsberg*.

Distrib. Chile (Valparaiso–Magellan), Fuegia, Falkland Islands, S. Georgia, Kerguelen, Heard Island.

No algologist has had such good opportunities for studying these plants as Dr. Skottsberg, and we must take his verdict that the debatable *L. ovata*, Hook. f. & Harv., is not specifically distinct from *L. flavicans* (= *L. fuscescens*). Skottsberg goes into the question of synonymy, and gives a good and illustrated account of the anatomical structure of both this and the two other Falkland Islands species.

L. frutescens, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 78, Taf. 8.

E. Falklands; Berkeley Sound, Port Louis, Port Stanley, *Skottsberg*.

Distrib. Falkland Islands.

In contrast to *L. flavicans* and *L. frutescens* this species is found in the uppermost part of the sublittoral region and is exposed at dead low-water.

Macrocystis pyrifera, *Ag. Sp.* i. p. 46.

Falkland Islands; general, all collectors.

Distrib. Galapagos Islands to Cape Horn, Fuegia, Patagonia, Falkland Islands, S. Georgia, Tristan da Cunha, Cape of Good Hope, Prince Edward Island, Crozets, St. Paul, New Amsterdam, Kerguelen, W. & S. Australia, Tasmania, New Zealand, Chatham Islands, Auckland Island, Campbell Island, Tahiti (*teste* Grunow); W. Coast N. America (Sitka–S. California), Okhotsk Sea, Aleutian Islands.

The classical account of this wonderful plant is to be found in the pages of the 'Flora Antarctica.' Hooker brings together 10 species under one name, and shows that the variation displayed at different localities is a matter of habitat. After a summary of the history of the alga he narrates his own observations in the Antarctic, and concludes with a paragraph on its interesting distribution. Circling the globe in the southern temperate and subantarctic zones, and stretching up with the Humboldt Current on the west coast of South America as far as the equator, the plant is found also in the Northern hemisphere from Alaska down to S. California. In the Atlantic and Indian Oceans, on the other hand, it is confined to the southern waters.

As regards the length of the fronds, Mrs. Vallentin writes:—"In the 'Flora Antarctica' Hooker stated that some of the plants which grew in Christmas Harbour, Kerguelen Island, were more than 300 feet long; and elsewhere near the same island, some specimens were estimated to measure 700 or even 1000 feet in length. Along the shores of this archipelago,

according to our observations, *Macrocystis* does not nearly approach these dimensions. The largest stranded specimen I have seen was one thrown on the shore of Port North beach after a heavy gale. The basket-like root measured exactly 36 inches in diameter, and the total length of the plant when stretched out along the shore was 195 feet. On one occasion while steaming up Falkland Sound I had exceptional opportunities, owing to the calmness of the sea, of making some fairly accurate observations as to the approximate lengths of floating specimens. We were steaming near Swan Island, where the water was never less than 16 fms. in depth, and the long trailing stems and fronds of this seaweed floated on the calm surface of the sea. Besides being a complete calm, it was slack water, so that the observations were made with a tolerable degree of accuracy. Taking the length of the steamer as 70 feet, and the depth of the water as 16 fathoms, the captain and I arrived at the independent conclusion that these examples of *Macrocystis* measured between 150 and 170 feet in length."

Skottsberg devotes 59 pages to *Macrocystis*, and his account is practically a memoir on the morpholgy and anatomy of the genus, though notes on the biology, phylogeny, and a review of the varieties and forms that have been described, are included.

In the work on Peru algæ just published by Howe ('14) it will be seen that he is inclined to believe that "two reasonably distinct species" of *Macrocystis* occur on the west coast of South America (pp. 60–66).

Cæpidium antarcticum, *J. Ag. in Hohenacker, Alg. exsicc.* no. 320; *Till Alg. Syst.* iv. p. 60.

E. Falklands; Port Stanley, *Hohenacker*; Port Louis, upper sublittoral and littoral rocks and pools, *Skottsberg*.

Distrib. Falkland Islands, S. Georgia.

This curious alga, described from rather scanty material by J. Agardh, remained little known till rediscovered by Skottsberg. The latter gives descriptions of its early stages, and then proceeds to point out a most remarkable dimorphism, namely the possession of *Colpomenia*-like shoots. Agardh noted that it had a prostrate thallus and described rather vaguely the upright fertile shoots, and Skottsberg believes that the bladder-like structures found on it are also part of the plant itself.

Having regard to the wealth of preserved material studied by Skottsberg, one would be inclined to accept this conclusion in spite of its being so unexpected. Dr. Yendo, however, who has examined Agardh's material, assures me that he cannot accept Skottsberg's interpretation of the genus. The type according to Yendo is a *Chordaria* which possesses creeping branches and upright shoots. One specimen lacks the upright branches, but the other has several, and resembles very much an old and nearly decayed plant of *Chordaria abietina* (*cf.* Setchell & Gardiner, pl. 18, figs. 16 & 17).

Yendo maintains that the bladder-like fronds are quite distinct from the so-called fertile axis, and that they consist of young plants of *Colpomenia sinuosa* or an allied species.

In view of Dr. Yendo's intimate knowledge of the life-histories both of *Chordaria* and *Colpomenia* in the North Pacific, I feel bound to accept this conclusion, and believe that Dr. Skottsberg must have been misled, as have been other observers in similar cases, by the intimate connection of host and epiphyte. As it has not been possible to identify the *Chordaria*, the alga is here left under the old name *Cæpidium*. (See notes under *Colpomenia sinuosa*.)

Myrionema macrocarpum, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 49.
E. Falklands; Berkeley Sound, on *Macrocystis* and *Lessonia*, *Skottsberg*.
Distrib. Falkland Islands.

M. densum, *Skottsb. l. c.* p. 50.
E. Falklands; Berkeley Sound, on *Macrocystis* and *Lessonia*, *Skottsberg*.
Distrib. Falkland Islands.

Chordaria capensis, *Kütz. Tab. Phyc.* viii. p. 5, tab. 11.
W. Falklands; West Point Island, *Vallentin*, *Hennis*.
Distrib. Cape of Good Hope, Fuegia, Kerguelen.

This species may be considered as rare in the islands, as it was not found by Skottsberg or any previous collector. The five specimens brought home by Mrs. Vallentin agree with the Cape species rather than with *C. flagelliformis*, and it is probable that all the records of the latter from Fuegia refer to this species.

C. linearis, *Cotton*, comb. nov. (Pl. 5; Pl. 6. figs. 3 & 4.) *Mesogloia linearis*, Hook. f. et Harv. in Hook. Lond. Journ. Bot. iv. (1845) p. 251; Fl. Ant. ii. p. 470.
W. Falklands; West Point Island, *Hennis*.
Distrib. Fuegia, Falkland Islands.

The plant described by Hooker & Harvey as *Mesogloia linearis* has remained little known. Several plants were collected by the 'Erebus' and 'Terror' Expedition, but they were rather young and, as shown by comments on herbarium sheets, later algologists have doubted the validity of the species.

The structure of the stem is not that of *Mesogloia*, but rather that of *Chordaria*, though the frond is less firm and the tissue less parenchymatous than in *C. flagelliformis*. In habit the plant strongly resembles *Dictyosiphon fœniculaceus*, but is much more robust, the main stem in the dried specimen being as much as 1·5 mm. in diameter in an old plant.

The full and revised description of this species, which is illustrated on Plates **5** & **6**, is as under : —

Plants single or cæspitose, rather large, much branched, mucilaginous, brownish green when dried. Main shoots slender, 20–25 cm. long, 1–1·5 mm. diam., densely clothed with slender branches. Branches similar to main shoots, beset with scattered, scarcely branched ramuli. Structure of stem loosely cellular; cells 15–20 μ diam. intermixed with slender filaments 7–9 μ thick. Assimilating filaments club-shaped, 5–7-celled, densely packed, 50–70 μ long, 10–12 μ wide at apex. Hairs absent? Unilocular sporangia obovate, 45–50 × 22–25 μ.

Leptonema falklandicum, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 52.

E. Falklands; Port Louis, on *Rhodomela* in pools, *Skottsberg*.

Distrib. Falkland Islands.

Scytothamnus rugulosum, *Kjellm. in Engler u. Prantl, Natürl. Pflanzenf.* Teil i. Abt. 2, p. 214. *Rhodomela rugulosa*, Bory, Flore des Malouines, p. 593. *Stereocladon Lyallii*, Hook. f. et Harv. in Fl. Ant. ii. p. 468, tab. 174.

E. Falklands; Berkeley Sound, *Hooker*; Port Louis, *Skottsberg*. W. Falklands; Shallow Bay, *Vallentin*; West Point Island, *Hennis*.

Distrib. Fuegia, Falkland Islands, S. Orkney, Kerguelen.

S. fasciculatus, *Cotton*, comb. nov. *Dictyosiphon fasciculatus*, Hook. f. et Harv. in Fl. Ant. i. p. 178; ii. p. 467. *Scytothamnus australis*, Skottsb. *l. c.* p. 48, *non* Hook. f. et Harv.

E. Falklands, *Hooker*, *Vallentin*.

Distrib. Fuegia, S. Georgia, Kerguelen, Auckland Island.

This plant belongs to the genus *Scytothamnus*, as was hinted by De Toni. Skottsberg with some reservation links it with *S. australis*, but, from an examination of several specimens in the Hooker herbarium, it appears to me to be a good and distinct species. For the present therefore it seems best to retain the old specific name. *S. fasciculatus* differs from *S. australis* in being a much more slender plant with a different method of branching, and having a more southern range. Presumably all the plants collected by Skottsberg in the antarctic belong to this species, and not to *S. australis*.

Desmarestia Willii, *Reinsch, in Flora*, xlvi. (1888) p. 188. *D. viridis*, Hook. f. et Harv. in Fl. Ant. ii. pp. 178, 466 (*non* Lamx.).

E. Falklands; Berkeley Sound, Port William, *Hooker*; Port Louis, *Skottsberg*. W. Falklands; Shallow Bay, Roy Cove, in sublittoral region and in pools, *Vallentin*; West Point Island, *Hennis*.

Distrib. Fuegia, Falkland Islands, S. Georgia, Marion Island, Kerguelen, Auckland Island, Victoria Land, Franklin Island.

This species is apparently common in Fuegia and the Falkland Islands.

It was formerly regarded as the same as the European *D. viridis*, to which it is certainly very closely allied. Reinsch in 1888 referred the South Georgian specimens of the German South Polar Expedition of 1882–3 to a distinct species, *D. Willii*, and Skottsberg, who has had ample opportunities of examining the plant in the growing condition, agrees with him and regards all the subantarctic material previously referred to *D. viridis* as belonging to this species. *D. Willii* has a wide range in the subantarctic and was found in plenty by Mrs. Vallentin in the West Falklands.

Desmarestia Harveyana, *Gepp, in Journ. Bot.* xliii. 1905, p. 106 (figs. 11–15). *D. media*, Hook. f. et Harv. in Fl. Ant. ii. p. 466 (*non* Grev.). *D. compressa*, Skottsb. Subant. u. Ant. Meeresalgen, i. p. 19.

E. Falklands, *Lyall* (teste *Skottsberg*).

Distrib. Falkland Islands, S. Georgia, Graham Land.

According to the International Rules there was no occasion to change the name proposed by Mr. and Mrs. Gepp in favour of *D. compressa*, Skottsb. The evidence of the occurrence of the plant in the Falklands rests on Skottsberg's note (*l. c.* p. 19).

D. Rossii, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 249.

E. Falklands; Port William, *Hooker*, *Skottsberg*. W. Falklands; Roy Cove, Fox Bay, West Point Island, Saunders Island, *Vallentin*; Carcass Island, *Hennis*.

Distrib. Fuegia, Falkland Islands, Heard Island, South Orkney, Victoria Land.

Mrs. Vallentin, who collected several large specimens of this fine and distinct species, writes that "the plant is locally known as 'Fern Kelp,' and is rare at the present time. It occurs at West Point Island, Roy Cove, and the north side of Saunders Island, where it is occasionally torn off and washed ashore after gales, together with *Durvillea*, *Lessonia*, and *Macrocystis*. We have only once seen this species growing, that being at Gentoo rookery beach, Fox Bay, where it was exposed at extreme low-water. We hunted in vain for the plant at Berkeley Sound."

D. ligulata, *Lamour. Ess.* p. 25; *Hook. f. et Harv. in Fl. Ant.* ii. p. 467.

Falkland Islands, *Gaudichaud*; West Point Island, *Hennis*.

Distrib. Apparently general in the colder seas of both the N. and S. hemispheres.

As far as can be seen, the South American specimens differ in no way from those of Northern Europe.

D. firma, *Skottsb. l. c.* p. 21, figs. 15–17. *D. ligulata*, var. *firma*, J. Ag. Sp. Alg. i. p. 169.

Falkland Islands, teste *Skottsberg*.

Distrib. Chile, Fuegia, Falkland Islands, S. Georgia, Cape of Good Hope.

The distribution is that given by Skottsberg, who raises *D. ligulata*, var. *firma*, J. Ag., to specific rank. I am not clear as to the limits of this species as defined by him.

Stictyosiphon Decaisnii, *G. Murr. in Journ. Bot.* xxiv. (1891) p. 196. *Cladothela Decaisnii*, Hook. f. et Harv. in Fl. Ant. ii. p. 491.

E. Falklands; Berkeley Sound, *Hooker*; Port Stanley, *Vallentin*; Port Louis, in pools in littoral region, *Skottsberg*.

Distrib. Fuegia, Falkland Islands, S. Georgia.

? Punctaria plantaginea, *Grev. Alg. Brit.* p. 53.

E. Falklands; Port Louis, *Skottsberg*.

Distrib. Atlantic and Arctic Oceans, Fuegia, Falkland Islands.

Skottsberg found a few plants which he referred, with some reservation, to this species.

Corycus prolifer, *Kjellman in Engl. u. Prantl, Natürl. Pflanzenf.* Teil i. Abt. 2, p. 202, *pro parte*. *Punctaria lanceolatum*, Kütz. Sp. Alg. p. 484 (?).

E. Falklands; Berkeley Sound, *Hooker*, *Skottsberg*; Port William, *Hooker*, *Arnott*; Port Louis, *Skottsberg*; Port Stanley, *Vallentin*.

Distrib. Chile, Fuegia, Falkland Islands, S. Georgia.

See note on *Punctaria lanceolatum* on p. 200.

Scytosiphon lomentarius, *J. Ag. Sp.* i. p. 126.

E. Falklands; Berkeley Sound, *Hooker*, *Vallentin*; Port Louis, *Skottsberg*. W. Falklands; Shallow Bay, West Point Island, on rocks near low water, *Vallentin*.

Distrib. General in temperate and cold seas, but not known from the tropics.

This, together with *Phyllitis fascia*, is one of the few well-marked and fairly large Falkland Phæophyceæ which is very widely distributed. Hooker found it plentifully at Berkeley Sound, and Mrs. Vallentin collected well-grown specimens in the Western islands.

S. crispus, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 35.

E. Falklands; Port Louis, *Skottsberg*.

Distrib. Falkland Islands.

A small species detected by Skottsberg and only known from one locality.

Phyllitis fascia, *Kütz. Phyc. Gen.* p. 342.

E. Falklands; Berkeley Sound, *Hooker*; Port Louis, in pools and shallow sublittoral, *Skottsberg*.

Distrib. Atlantic and Arctic Oceans, Mediterranean, North Pacific (Japan and America), S. Peru, Fuegia, Falkland Islands, S. Georgia.

The forms assumed in the subantarctic are very similar to those found in Europe.

Colpomenia sp. *Asperococcus sinuosus*, Hook. f. et Harv. in Fl. Ant. ii. p. 468.

E. Falklands; Berkeley Sound, *Hooker*. W. Falklands; Roy Cove, *Vallentin*.

Distrib. Falkland Islands, S. Georgia, Kerguelen (?).

See notes under *Capidium antarcticum*, p. 168. Skottsberg's account of the bladder-like shoots seem to prove that the plant cannot be referred to *Colpomenia sinuosa*. The forked basal branches described by him would appear to be part of the *Colpomenia* plant (and not of the *Chordaria*), and these are unlike anything found in the ordinary *Colpomenia* of Europe. Skottsberg refers to Mitchell's account, and gives other reasons (p. 44) why he cannot identify it with the *C. sinuosa* of warmer seas. It may be noted here, however, that, since the publication of his report, *Colpomenia* has appeared in the English Channel, and from the variability in the distribution of the sporangia and tufts of hairs shown by British material, it is evident that some of the reasons advanced by Skottsberg will have to be reconsidered, and that before it is possible to express a definite opinion on the identity of the various extra-European forms a detailed morphological and anatomical study of old *C. sinuosa* of the Mediterranean is necessary.

Mrs. Vallentin collected several specimens at Roy Cove, but from dried material it is impossible to throw further light on so difficult a problem. Pending further investigation of preserved material I have left the plant as *Colpomenia* sp.

Utriculidium Durvillei, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 36. *Adenocystis Durvillæi*, Hook. f. et Harv. in Fl. Ant. ii. p. 468.

E. Falklands; Port Louis, Port Stanley, *Skottsberg*.

Distrib. Fuegia, Falkland Islands, S. Georgia, Kerguelen.

On the ground of the plurilocular sporangia Skottsberg separates *Adenocystis Durvillei* from *A. utricularis*, Skottsb. (=*A. Lessonii*, Hook. et Harv.), and raises it to generic rank. There appear to be no specimens of this species in the Kew Herbarium.

Sphacelaria furcigera, *Kütz. Tab. Phyc.* v. p. 27, tab. 90.

E. Falklands; Port Louis, *Skottsberg*.

Distrib. Probably cosmopolitan.

Cladostephus setaceus, *Suhr, in Flora*, xix. (1836) p. 347. *C. spongiosus*, Hook. f. et Harv. in Fl. Ant. ii. p. 469 (*non* Ag.).

E. Falklands ; Port William, Berkeley Sound, *Hooker* ; Port Louis, *Skottsberg*.

Distrib. Fuegia, Falkland Islands, Australia (?), Tasmania (?).

Skottsberg shows that Harvey's *C. spongiosus* from the Falklands is Suhr's *C. setaceus*, which he states is synonymous with Kützing's *C. antarcticus*. He remarks that the plant is common in the sublittoral zone down to a depth of 18 fathoms.

Halopteris obovata, *Sauv. in Journ. de Bot.* xviii. (1904) p. 92. *Sphacelaria obovata*, Hook. f. et Harv. in Fl. Ant. ii. p. 469.

E. Falklands ; Port Louis, *Skottsberg*.

Distrib. Fuegia, Falkland Islands, S. Georgia.

This species was wrongly united by De Toni, Syll. Ag. iii. p. 517, with *Stypocaulon funiculare*.

H. funicularis, *Sauv. in Journ. de Bot.* xvii. (1903) p. 334.

Falkland Islands, *Skottsberg*.

Distrib. Fuegia, S. Georgia, Tristan da Cunha, Australia, New Zealand, Auckland Island.

Pylaiella litoralis, *Kjellman*, *Bidr. Skand. Ectocarp.* p. 99.

E. Falklands ; Port Louis, Duperrey Harbour, *Skottsberg*.

Distrib. Cosmopolitan.

Ectocarpus siliculosus, *Lyngb. Hydrophyt. Dan.* p. 131 ; *Hook. f. et Harv. in Fl. Ant.* ii. p. 469.

E. Falklands ; Berkeley Sound, *Hooker* ; Port Stanley, *Vallentin* ; Port Louis, *Skottsberg*.

Distrib. Cosmopolitan.

E. Constanciæ, *Hariot, in Journ. de Bot.* i. (1887) p. 56.

E. Falklands ; epiphytic in sublittoral region and in pools, *Skottsberg*.

Distrib. Fuegia, Falkland Islands, S. Georgia, Kerguelen.

E. exiguus, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 5. *E. humilis*, Reinsch, Meeresalg. Südgeorg. p. 411.

E. Falklands ; Port Louis, *Skottsberg*.

Distrib. Fuegia, Falkland Islands, S. Georgia.

E. falklandicus, *Skottsb. l. c.* p. 5.

E. Falklands ; Port Louis, *Skottsberg*.

Distrib. Falkland Islands.

E. PECTINATUS, *Skottsb. Subant. u. Ant. Meeresalgen*, i. p. 11.
E. Falklands; Port Louis, on *Cladophora*, *Skottsberg*.
DISTRIB. Falkland Islands.

GEMINOCARPUS GEMINATUS, *Skottsb. l. c.* p. 13. *Ectocarpus geminatus*, Hook. f. et Harv. in Fl. Ant. ii. p. 469.
E. Falklands; abundant, *Hooker*; Port Louis, general, very luxuriant, clothing stones, mussels, and other algæ in littoral and sublittoral region, *Skottsberg*. W. Falklands; West Point Island, *Vallentin*.
DISTRIB. Fuegia, Falkland Islands, Graham Land, S. Georgia, Kerguelen, Victoria Land.

FLORIDEÆ.

PORPHYRA UMBILICALIS, *Kütz. Phyc. Gen.* p. 383. *P. vulgaris*, Ag.; Hook. f. et Harv. in Fl. Ant. ii. p. 500.
Falkland Islands, abundant, all collectors.
DISTRIB. Cosmopolitan.
Both the short umbilicate and long laciniate forms occur.

P. LEUCOSTICTA, *Thur. in Le Jol. List Alg. Cherb.* p. 100.
Falkland Islands, *Hooker*.
DISTRIB. Atlantic and Mediterranean.
The presence of this species is doubtful, but Hariot lists a Hooker specimen in his Cape Horn memoir.

CONCHOCELIS ROSEA, *Batters in G. Murr. Phyc. Mem.* i. (1892) p. 27, tab. 7.
W. Falklands; in shells, Roy Cove, *Vallentin*.
DISTRIB. Probably cosmopolitan.
Frequent in shells, and, as far as could be seen, indistinguishable from European material.

CHÆTANGIUM FASTIGIATUM, *J. Ag. Sp.* i. p. 460. *Halymenia fastigiata*, Bory, Fl. des Malouines, no. 23. *Nothogenia variolosa*, Mont.; Hook. f. et Harv. in Fl. Ant. ii. p. 487, *pro parte*.
E. Falklands; Berkeley Sound, *Hooker*; Port Stanley, *Vallentin*, *Hohenacker*. W. Falklands; Roy Cove, *Vallentin*.
DISTRIB. Fuegia, Kerguelen.
It appears possible that *Chætangium variolosum*, described by Montagne from Auckland Island in 1842, is merely a large full-grown example of *C. fastigiatum*, which was originally described by Bory from the Falkland Islands (1828). In any case, with one exception, all the South American and Falkland Islands specimens in the Kew Herbarium, though labelled

C. variolosum, belong rather to *C. fastigiatum*, and the same applies to the Kerguelen specimens. The exception (a Hooker specimen from Magellan) is intermediate in form and would appear to be composed of loose tissue in the young fronds, which becomes dense and compact later. Hohenacker's *Dumontia fastigiata*, var. *minor*, Exsicc. 282, from the East Falklands, is, in the British Museum set, a small specimen only, but clearly not referable either to *Dumontia* or *Chætangium*.

Chætangium variolosum, *J. Ag. Sp.* p. 461. *Nothogenia variolosa*, Mont.; Hook. f. et Harv. in Fl. Ant. ii. p. 487, *pro parte*.

E. Falklands; Berkeley Sound, teste *Hooker*.

Distrib. Auckland Island, Fuegia (?), Kerguelen (?).

See note under *C. fastigiatum*.

Gelidium crinale, *J. Ag. Epicr.* p. 546.

Falklands; Herb. Lenormand, *Lesson*, teste *Hariot*.

Distrib. North Atlantic (Europe and America), Mediterranean, Queensland.

This plant is probably more widely distributed than generally supposed. Specimens were recently received at Kew from Queensland, the first record for the continent of Australia.

? Chondrus crispus, *Lyngb. Hydrophyt. Dan.* p. 15.

Falklands, *Gaudichaud*.

Distrib. North Atlantic (Europe and America), Japan. Graham Land.

The only evidence of this plant having been found in the Falkland Islands is Gaudichaud's specimen in the Paris Museum. Hariot (*l. c.* p. 62) was inclined to believe that the locality might have been incorrect; but, as Gain states that a plant indistinguishable from this species is plentiful in the islands off Graham Land, it is possible that it extends also to higher latitudes.

Iridæa cordata, *J. Ag. Sp.* ii. p. 254; *Hook. f. et Harv. in Fl. Ant.* ii. p. 485. *I. laminarioides*, Bory, Voy. 'Coquille,' p. 105. *I. micans*, Bory, *l. c.* p. 110.

Falkland Islands; general, all collectors.

Distrib. Chile, Fuegia, Graham Land, S. Georgia, Victoria Land. North Pacific (Alaska–California).

I have followed Gain, who unites *I. micans* with *I. cordata*. Hooker and Harvey held this view, though subsequently treated them as distinct. Gain gives a useful history of the plant, together with a full list of synonyms. From his account one would be almost justified in assuming that all the so-called species of the genus from South America and the Subantarctic are merely forms of the exceedingly variable *I. cordata*.

Professor W. A. Setchell, who more than anyone else has studied *Iridæa* in the living state, likewise believes, though he adopts a slightly different nomenclature, that most of the so-called species cannot be maintained. He kindly examined two of the extreme forms found by Mrs. Vallentin in the Falkland Islands, and in a letter concerning them expresses his views as follows:—

"So far as I can make out, the only real point of difference between *Iridæa micans* and *Iridæa laminarioides* is to be found in the slightly broader base of the former, together with its serrulate margin. From my experience of this genus on the coast of California, I am not inclined to believe that either character is a constant one. I have watched *Iridæa* species through the year, and found that they vary. I have found a serrulated-margined specimen in the midst of a clump with entire margins. I found according to the exposure, depth of water, etc., that the texture and shade of colour varied so much that all I can do at present is to refer these various species as forms, or at most varieties, under *Iridæa laminarioides*. The one species I feel at all certain of being able to distinguish from *Iridæa laminarioides* is *I. Augustinæ*. That has a rough surface, but at times it is smooth except very near the base. . . . . Consequently my opinion would be that your plants are forms or varieties of *Iridæa laminarioides*, but if you prefer that they may be separated from this species, they are to be referred to *Iridæa micans*."

Professor Setchell further remarks: "As you are probably aware, I am inclined to refer even the *cordata* series to *Iridæa laminarioides*"; and in his work on the Algæ of North-West America he places *I. cordata* as a form of that species.

Gigartina radula, *J. Ag. Alg. Liebm.* p. 12; *Sp.* ii. p. 278. *Iridæa radula*, Bory, Voy. 'Coquille,' p. 107; Hook. f. et Harv. in Fl. Ant. ii. p. 485.

Falklands; general, all collectors.

Distrib. Fuegia, Falkland Islands, Kerguelen, Islands off Louis Philippe's Land and Graham Land, New Zealand, Auckland Island, Campbell Island. Cape of Good Hope. N. Pacific (Vancouver–California).

Several portions of very large fronds were brought home by Mrs. Vallentin, and also young and entire plants. The majority possess cystocarps in the usual apiculate tubercles, but a few fronds contain tetrasporic sori; and the latter are rough with small papillæ, though the sori themselves are for the most part embedded in the substance of the fronds.

Phyllophora cuneifolia, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 260; *Fl. Ant.* ii. p. 486. (Pl. 7.)

E. Falklands; Port William, St. Salvador Bay, *Hooker*. W. Falklands; West Point Island, *Vallentin, Hennis*.

Distrib. Falkland Islands, Kerguelen (?).

A rare and little-known plant. The species is based on Hooker's Falkland Islands specimens, and has not been found since. Two doubtful gatherings from Kerguelen exist at Kew, one of which is named and recorded by Hooker, but the plant differs considerably from the type, and is, indeed, marked by him with a query.

De Toni (Syll. Alg. iv. p. 257) has cast doubt on the generic position of the species. A photograph of one of the two original specimens at Kew is reproduced on Plate 7; the other specimen, from St. Salvador Bay, is less elongated and has broader fronds. From the form and structure of these specimens the plant appears to be a genuine *Phyllophora*, though, as both are sterile, it is impossible to speak with certainty. The specimens collected at West Point Island, referred with some doubt to this species, are also sterile.

Ahnfeltia plicata, *Fr. Fl. Scan.* p. 310. *Gigartina plicata*, Grev.; Hook. f. et Harv. in Fl. Ant. ii. p. 487.

E. Falklands; in herb. Lenormand, teste *Hariot*; St. Salvador Bay, Cape Pembroke, *Hooker*; Port Stanley, *Hohenacker*, no. 555. W. Falklands; West Point Island, *Vallentin*.

Distrib. North temperate and Arctic regions. Fuegia, S. Georgia, Kerguelen.

Hariot unites *Gracilaria? aggregata*, Hook. f. et Harv., with the present species, but, as explained below (p. 179), this course cannot be adopted.

Sterrocolax decipiens, *Schmitz, in Flora*, lxxvii. (1893) p. 397.

E. Falklands; on *Ahnfeltia plicata*, Port Stanley, *Hohenacker*, no. 555.

Distrib. Probably the same as *Ahnfeltia plicata*.

Callophyllis fastigiata, *J. Ag. Epic.* p. 229. *Rhodymenia sobolifera*, Hook. f. et Harv. in Fl. Ant. ii. p. 475 (*non* Greville).

Falkland Islands; general, most collectors.

Distrib. Fuegia, Falkland Islands, Kerguelen.

C. variegata, *Kütz. Phyc. Gen.* p. 400. *Rhodymenia variegata*, Mont.; Hook. f. et Harv. in Fl. Ant. ii. p. 475, *excl.* var. β et γ.

Falkland Islands; general, all collectors.

Distrib. Peru, Chile, Fuegia, Falkland Islands, S. Orkneys, Graham Land, Kerguelen.

C. atro-sanguinea, *Hariot, in Journ. de Bot.* i. (1887) p. 73; *Miss. Cap Horn*, p. 75, pls. viii. & ix. *Rhodymenia variegata*, var. β. *atro-sanguinea*, Hook. f. et Harv. in Fl. Ant. ii. p. 476.

E. Falklands; Cape Pembroke, *Hooker*. W. Falklands; West Point Island, *Vallentin, Hennis*.

Distrib. Fuegia, Falkland Islands, Kerguelen (*Eaton*!).

Hariot is certainly right in separating this plant from the last. De Toni places it with a query under *Rhodymenia*, but Hariot distinctly states that the cystocarp is that of *Callophyllis*.

Callymenia antarctica, *Hariot, Prem. Expéd. Ant. Franç., Algæ*, p. 7 ; *Gain, Deux. Expéd. Ant. Franç., Algæ*, p. 60.

W. Falklands ; West Point Island, *Hennis*.

Distrib. Graham Land, Falkland Islands.

C. antarctica is the only species of the genus known from the Antarctic or Subantarctic regions. Hariot's description is somewhat brief, but, as the Falkland Islands specimens agree well with it, there seems no reason to regard them as distinct. The plant was found by both the French expeditions, and on each occasion off Graham Land ; the present record, therefore, gives it extension of range.

The alga is certainly a *Callymenia*, ripe cystocarps showing the usual structure of the genus. The fronds in the present gathering are ovate, tapering gradually to the base or more or less truncate, and the tufted habit noted by Hariot is well marked.

Catenella Opuntia, *Grev. Alg. Brit.* p. 163, tab. 17.

W. Falklands ; Roy Cove, *Vallentin*.

Distrib. N. Atlantic, New Zealand, Chile, Fuegia.

C. Opuntia is probably more widely spread than hitherto supposed. It is an addition to the Falkland Islands list, but was recorded by Hariot from Fuegia.

Acanthococcus antarcticus, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 261 ; *Fl. Ant.* ii. p. 477, tab. 181.

E. Falklands, *Hohenacker* : Port William, Cape Pembroke, Berkeley Sound, *Hooker* ; Port Stanley, *Abbott*. W. Falklands ; West Point Island, *Vallentin, Hennis* ; Roy Cove, *Vallentin*.

Distrib. Fuegia, Falkland Islands, Kerguelen.

A. spinuliger, *J. Ag. in Act. Holm. Öfvers.* 1849, p. 87. *Gracilaria obtusiangula*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 260.

E. Falklands, *Gaudichaud, Freycinet* ; St. Salvador Bay, *Hooker*. W. Falklands ; West Point Island, *Vallentin, Hennis*.

Distrib. Fuegia, Falkland Islands, S. Orkneys.

Gracilaria aggregata, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 261 ; *Fl. Ant.* ii. p. 478.

E. Falklands ; Berkeley Sound, *Hooker*. W. Falklands ; West Point Island, *Hennis*.

Distrib. Falkland Islands, Graham Land (?).

G. aggregata was described by Hooker & Harvey in 1845 from specimens collected in Berkeley Sound. The material was sterile and the generic position of the genus was marked with a query. In 1889 Hariot, on the evidence of a specimen from the Hooker collection, reduced the plant to a synonym of *Ahnfeltia plicata*. His conclusions were incorporated in De Toni's 'Sylloge,' and the name has disappeared from the Antarctic lists.

Hariot's specimen, however, was evidently wrongly named, since the type-material in Hooker's herbarium is quite distinct from *Ahnfeltia*, being stouter, springing from a large basal disk, and possessing internally larger cells. The plant has, as Hooker states, all the appearance of a *Gracilaria*. Fortunately it is now possible to confirm this point, as in Miss Hennis's collection there are a few specimens of the same species, some of which bear the well-marked *Gracilaria* cystocarps. Hooker's specimens are slightly stouter than those collected by Miss Hennis, but this is probably due to their being somewhat old.

Though *G. aggregata* would appear to be a rather uncommon plant, it is possible that it may have been collected in South America and recorded under *Gymnogongrus* spp. or other name. It resembles in habit the short, much branched forms of *G. confervoides*, and it is not improbable that the Antarctic record of the latter species (Hariot, '07) refers in reality to *G. aggregata*. From *G. confervoides* the present plant differs in its large scutate base, small medullary cells, and apparently also in its consistently shorter and more branched habit.

Rhodymenia palmata, *Grev. Alg. Brit.* p. 93 ; *Hook. f. et Harv. in Fl. Ant.* ii. p. 475.

E. Falklands ; Berkeley Sound, Port William, *Hooker* ; Port Stanley, *Cunningham*. W. Falklands ; West Point Island, *Vallentin*.

Distrib. N. Atlantic. N. Pacific (Alaska–N. California, Japan). Fuegia, Falkland Islands, S. Georgia, Kerguelen.

Hooker remarks :—"The Dulse so commonly eaten on the coasts of Scotland is not an unfrequent seaweed on the shores of the Falkland Islands, where it was quickly recognized by some of the north-country seamen of the 'Erebus' and 'Terror.'"

It may be remarked here that the record of *R. palmata*, var. *sobolifera* (=*R. sobolifera*, Hook. f. et Harv., *non* Grev.), in 'Flora Antarctica' is incorrect, all the specimens representing *Callophyllis fastigiata* ; also that the 'Challenger' *Callymenia dentata* records from Kerguelen should be deleted, the specimens being referable to *R. palmata*.

R. flabellifolia, *Mont. Voy.* '*Bonite*,' p. 105 ; *Hariot, Miss. Cap Horn*, p. 77. *R. palmetta*, Hook. f. et Harv. in Fl. Ant. ii. p. 475 (*non* Grev.).

Falklands, *Gaudichaud*.

Distrib. Peru, Chile, Fuegia.

The record of this rests on Gaudichaud's *R. palmetta*, which was re-examined by Hariot. The plant is possibly the same as that which I have referred to *Phyllophora cuneifolia*.

Plocamium secundatum, *Kütz. Tab. Phyc.* xvi. p. 15, tab. 42. *P. coccineum*, Lyngb. ; Hook. f. et Harv. in Fl. Ant. ii. p. 474 (partim).

E. Falklands ; Berkeley Sound, Cape Pembroke, *Hooker* ; Stanley Harbour, *Vallentin*. W. Falklands ; King George's Sound, Roy Cove, West Point Island, *Vallentin* ; West Point Island, *Hennis*.

Distrib. Fuegia, Falkland Islands, S. Orkneys, Kerguelen (teste *Askenasy*).

All the Falkland Islands material that I have seen belongs to the plant named by Kützing *P. secundatum*. Hariot followed Hooker, referring his Fuegian material to *P. coccineum* ; but it appears to me that *P. secundatum* is a valid species.

Nitophyllum lividum, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 253 ; *Fl. Ant.* ii. p. 472, tab. 179.

E. Falklands ; Port William, Berkeley Sound, *Hooker* ; Port Stanley, *Abbott*. W. Falklands ; Roy Cove, *Vallentin*.

Distrib. Fuegia, Falkland Islands, Kerguelen (?).

Nitophylla are abundant in the Falkland Islands, but, as in the north temperate regions, are difficult to understand correctly except from a good series of specimens or when studied in their natural surroundings. *N. lividum* is one of the rarer species ; a single specimen from Roy Cove, which agrees with the types at Kew except for the colour being more purple and less livid, is here referred to it. Though young, the plant bears antheridial sori : these are densely scattered over the entire surface of the frond as minute, slightly elongated spots. The nerves are well developed at the base, but the lamina is veinless. The species has been recorded from Kerguelen both by Dickie and Askenasy. Dickie's Kew specimens are, however, doubtful, differing from the type in colour and outline of fronds.

N. Grayanum, *J. Ag. Bidr. Florid. Syst.* p. 48.

Falkland Islands, *Abbott* ; in herb. Gray, teste *Agardh*.

Distrib. Falkland Islands.

Professor Nordstedt was kind enough to send a tracing of the type of *N. Grayanum*, which was based on a specimen from the Falklands in herb. Gray. The plant, somewhat torn and imperfect, consists of an oblong-lanceolate frond bearing tetraspores over the entire surface. It differs from *N. Smithii* in the absence of nerves, and is probably closely related to *N. laciniatum*.

Nitophyllum multinerve, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 255 ; *Fl. Ant.* ii. p. 473.

E. Falklands ; Berkeley Sound, *Hooker* ; Port Stanley, *Abbott*. W. Falklands ; West Point Island, *Vallentin*, *Hennis*.

Distrib. Fuegia, Falkland Islands, Kerguelen, New Zealand, Auckland, Tasmania.

Several fine specimens of this beautiful and well-marked species were forwarded. It is fairly frequent in the Magellan region, and the specimens from New Zealand and Tasmania, though differing slightly, appear to be referable to the same species.

N. Smithii, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 256 ; *Fl. Ant.* ii. p. 473, tab. 178.

E. Falklands ; Cape Pembroke, *Hooker*.

Distrib. Falkland Islands.

One of the less satisfactory of Hooker & Harvey's species, as the original gathering is mixed and the figure in 'Flora Antarctica' is a composite one. The central figure must, I think, be regarded as the type, and the original of this is at Kew ; the smaller lateral fronds, the "veinless varieties," evidently represent other specimens. The type is a strongly veined, very marked plant, and I have seen no other specimens which I could with certainty refer to it. The other 1842 gatherings named *N. Smithii* in the Kew collections are referable to *N. laciniatum*.

N. laciniatum, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 256. *N. Bonnemaisoni*, var. *laciniatum*, Hook. et Harv. in Fl. Ant. ii. p. 474.

E. Falklands ; Berkeley Sound, *Hooker* ; Port Stanley, *Abbott*, *Vallentin*. W. Falklands ; West Point Island, *Vallentin*, *Hennis*.

Distrib. Fuegia, Falkland Islands, Kerguelen (?).

Judging from Hooker's specimens, the typical form of *N. laciniatum* has somewhat the outline of *Callophyllis laciniata*, but it varies from the blunt lobes of *N. Bonnemaisoni* to the deeply cleft, almost pinnately branched segments of *N. laceratum*. It appears to be not infrequent in the Magellan region, and is very closely allied to the last-named, from which in the sterile state it is almost impossible to distinguish it. The tetraspores are, however, scattered over the whole frond, and not confined to the margins or lateral proliferations.

Several large specimens in Mrs. Vallentin's algæ I have referred somewhat doubtfully to this species.

? N. Durvillei, *J. Ag. Sp.* ii. p. 666. *Delesseria platycarpa*, Hook. f. et Harv. in Fl. Ant. ii. p. 471 (*non* Lamour.).

E. Falklands ; Port William, Cape Pembroke, *Hooker*.

Distrib. Chile.

The plant recorded as *D. platycarpa* in 'Flora Antarctica' is certainly not the same as *D. platycarpa*, Lamour. (=*Botryoglossum platycarpum*, Kütz.), from the Cape. It is apparently a rare or local species, as it has not been obtained since Hooker's time, but his record remains. The original specimens have tetraspores in the main fronds as in *Nitophyllum*, and not in special leaflets as in *Botryoglossum*, and correspond fairly closely with Bory's figure of *N. Durvillei* ('28, tab. 19). This alga was collected at Concepcion, Chile, and is little known; hence, though the Falkland Island plant is closely allied to it, it appears best not to link it too definitely with that species till further data on the distribution and variation are available. It is therefore listed with a query.

Platyclinia Crozieri, *J. Ag. Sp.* iii. 3, p. 107. *Nitophyllum Crozieri*, Hook. f. et Harv. in Fl. Ant. ii. p. 172, tab. 177.

W. Falklands; West Point Island, *Vallentin*.

Distrib. Fuegia, Falkland Islands.

J. Agardh, during the last years of his life, transferred this well-marked and very fine species, together with two others, to a separate genus, *Platyclinia*, the necessity of which was open to question. In addition to its laminate frond, *P. Crozieri* may be distinguished from other Falkland Islands Nitophylleæ by the tendency of the cells to be collected together into groups of 2 or 4 as in *Porphyra*.

Delesseria phyllophora, *J. Ag. Bidr. Florid. Syst.* p. 55. *D. crassinervia*, Hook. f. et Harv. in Fl. Ant. ii. p. 471, partim (*non* Montagne).

E. Falklands; Berkeley Sound, *Hooker*.

Distrib. Falkland Islands.

The nomenclature of the Delesserieæ is much complicated, owing to the liberal views as to species held by the older writers and by the poorness of much of the original material. *D. phyllophora* was one of the species separated from *D. crassinervia*, Hook. f. & Harv. (*non* Mont.), by J. Agardh. It was founded on a Falkland Island specimen collected by Hooker in 1842, and two or three plants apparently referable to it exist at Kew. The Kerguelen plant recorded by Hooker and Harvey is probably distinct from *D. phyllophora*, which, so far as I can judge, has not been met with elsewhere nor since that date.

Paraglossum lancifolium, *J. Ag. Sp.* iii. 3, p. 217. *Delesseria sanguinea*, var. *lancifolia*, Hook. f. et Harv. in Fl. Ant. ii. p. 470.

W. Falklands; West Point Island, *Vallentin*, *Hennis*.

Distrib. Fuegia, Falkland Islands.

It is with some hesitation that this species is added to the Falkland Islands list. Agardh quoted *D. sanguinea*, var. *lancifolia*, Hook. f. et Harv., as a

doubtful synonym of his species *D. lancifolia* from the same locality. This has generally been assumed to be correct, and the Hooker specimens at Kew are found to agree fairly well with Agardh's description. The single and very fine specimen collected by Mrs. Vallentin is useful in providing the hitherto-unknown cystocarps. These are borne in minute proliferations, which arise over the entire surface of the frond. The cystocarps occur singly or in twos in the proliferations.

D. lancifolia, var. *minor*, Laing (Trans. N.Z. Instit. xxix. p. 450), from Macquarie, is probably a distinct species.

Paraglossum epiglossum, *J. Ag. Sp.* iii. 3, p. 217. *Delesseria crassinervia*, Hook. f. et Harv. in Fl. Ant. ii. p. 471, partim (*non* Montagne).

E. Falklands, *Hooker*.

Distrib. Falkland Islands, Fuegia, Kerguelen (?).

D. crassinervia covered a number of species. The true plant, known only with certainty from New Zealand, Campbell and Auckland Islands, appears to be a *Hypoglossum*, and *D. Montagneana*, which was separated from it, has been shown by Laing also to be a composite species. *P. epiglossum* is, so far as known, confined to the Cape Horn district.

Pteridium Bertrandii, *Cotton*, sp. nov. (Pl. 8.)

Delesseria Davisii, Dickie, in Journ. Linn. Soc., Bot. xv. (1876) pp. 45 et 200, *non* Hook. f. et Harv.

Frondes amplæ, cæspitosæ, dense dichotomæ, 15–20 cm. longæ. Rami ramulique complanati, costati, alati, ligulati vel ligulato-cuneati, 5–8 mm. lati, supra sinus plerumque oblique excisi, venis lateralibus omnino deficientibus, margine undulata fere integra. Cystocarpia non spinosa, in segmentis terminalibus sparsa, costæ imposita. Tetrasporangia utroque latere et supra costæ ramulorum disposita, sori vix discreti.

W. Falklands ; West Point Island, *Vallentin*.

Distrib. Kerguelen (*Moseley & Eaton*), Fuegia (Port Famine, *Hooker*). W. Falklands (?).

The present species is apparently frequent in Kerguelen, and it occurs also in the Magellan district. In the tetrasporic state it is very well marked, but in the sterile or even cystocarp condition it is not always easy to identify with certainty. For this reason the Falkland Island record has had to be marked with a query ; but, as the plant occurs at Port Famine, there is no danger of a geographical error. Abundant material from Kerguelen exists in herbaria, and, being hitherto undescribed, it was advisable to deal with the plant even though its discovery on the Falklands themselves had not been positively certified. The type-material is that collected by Eaton during the 'Transit of Venus' Expedition (see Plate 8).

The cuneate segments give the plant a very marked appearance, though it

is probable that under certain conditions or in certain stages of growth the fronds of other species possess a similar outline. The cystocarps being situated on the nerves, and the tetraspores in sporangial plants in lines on either side, locate it as a *Pteridium*, where it is fairly distinct from other species. From *Pteridium proliferum*, A. & E. S. Gepp, which was collected at the Orkneys by the 'Scotia,' it differs in the broader segments and disposition of the tetraspores.

The species is named after the late Mr. W. Wickham Bertrand, Mrs. Vallentin's father, who took the greatest interest in the flora of the islands, and especially in the present collection of Cryptogams.

Glossopteris Lyallii, *J. Ag. Sp.* iii. 3, p. 197. *Delesseria Lyallii*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 252; Fl. Ant. ii. p. 471, tab. 176 (*non* Harv. Alg. Austral. exsicc., *nec* Phyc. Austr.).

E. Falklands; Cape Pembroke, Port William, *Hooker*; Port Stanley, *Abbott*. W. Falklands: Roy Cove, West Point Island, Rapid Point, *Vallentin*; West Point Island, *Hennis*.

Distrib. Fuegia, Falkland Islands, Kerguelen.

Formerly thought to extend to Australia, but the specimens from that continent were shown by Agardh to be a distinct species (*D. simulans*).

Schizoneura quercifolia, *J. Ag. Sp.* iii. 3, p. 168. *Delesseria quercifolia*, Bory, Voy. 'Coquille,' p. 186, tab. 18. fig. 1; Hook. f. et Harv. in Fl. Ant. ii. p. 471.

E. Falklands: St. Salvador Bay, Berkeley Sound, Port William, Cape Pembroke, *Hooker*; Port Stanley, *Abbott*. W. Falklands; West Point Island, Roy Cove, Dunmose Head, *Vallentin*.

Distrib. Fuegia, Falkland Islands, Graham Land (teste *Gain*), S. Georgia (teste *Reinsch*), Kerguelen (broad form only), Coulman Island (teste *Gepp*).

It is possible that more than one species is at present included under this name, as there are a few specimens both in the Hooker and Vallentin collections which have fronds markedly broader and of a deeper colour than the ordinary form.

S. Davisii, *J. Ag. Sp.* iii. 3, p. 168. *Delesseria Davisii*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 252; Fl. Ant. ii. p. 470, tab. 175.

E. Falklands; Berkeley Sound, *Hooker*.

Distrib. Fuegia! Falkland Islands (?).

There are four of Hooker's specimens at Kew, three precisely similar from Cape Horn agreeing with the figure in 'Flora Antarctica,' and a fourth, apparently different, from Berkeley Sound. Its claim to occur in the Falklands is therefore doubtful. Dickie's Kerguelen record is certainly incorrect,

the speciments both at Kew and the British Museum being quite distinct and approaching rather *S. dichotoma*.

PTILONIA MAGELLANICA, *J. Ag. Sp.* ii. p. 744. *Plocamium? magellanicum*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 257; Fl. Ant. ii. p. 474.

Falklands; general, many collectors.

DISTRIB. Fuegia, Falkland Islands, Kerguelen.

The fronds of this plant are apt to be mistaken for a broad form of *Plocamium*. It is very frequent in the Cape Horn region and in the Falklands, but elsewhere has only been found at Kerguelen.

CHONDRIA sp. *Laurencia pinnatifida*, var. *angustata*, Hook. f. et Harv. in Fl. Ant. ii. p. 484.

E. Falklands; Berkeley Sound, Cape Pembroke, *Hooker*. W. Falklands: Roy Cove, West Point Island, *Vallentin*.

DISTRIB. S. Chile, Falkland Islands.

Although the genus has never been recorded from the Magellan region, a species of *Chondria* certainly occurs in the Falklands. Mrs. Vallentin brought home several specimens, and the Kew collections show that Hooker collected the same plant in 1842, and referred it in 'Flora Antarctica' to *Laurencia pinnatifida*, var. *angustata*. This species has since been recorded by other authors, and it continues to find a place in antarctic lists. All the specimens I have seen, however, should be referred to *Chondria*, and it is very doubtful if *Laurencia* occurs at all in that region.

Species of the present genus possess few distinctive characters, and are, especially in the dried state, difficult to classify. The Falkland Island plant is cæspitose, and approaches *C. atropurpurea*, Harv., from the North Pacific, in habit, but, until its range of variation and its reproductive organs are more perfectly known, it is impossible to decide on its specific identity.

LOPHURELLA COMOSA, *Falk. Rhodomelaceen*, p. 158, t. 19. fig. 31. *Rhodomela comosa*, Hook. f. & Harv. in Lond. Journ. Bot. iv. (1845) p. 263; Fl. Ant. ii. p. 482, tab. 185.

E. Falklands; Berkeley Sound, St. Salvador Bay, *Hooker*. W. Falklands; Shallow Bay, *Vallentin*; West Point Island, *Hennis*.

DISTRIB. Falkland Islands.

The dense fibrillose shoots, which give it somewhat the appearance of *Polysiphonia fibrillosa*, distinguish this from allied species of the genus.

L. HOOKERIANA, *Falk. Rhodomelaceen*, p. 158. *Rhodomela Hookeriana*, J. Ag. Sp. ii. p. 880. *Lophura tenuis*, Kütz. Diagn. u. Bemerk. no. 68,

p. 18; De Toni, Syll. Alg. iv. p. 1133. *Rhodomela Gaimardi*, Hook. f. et Harv. in Fl. Ant. ii. p. 481, tab. 184 (*non* Ag., *nec* Mont.).

E. Falklands: Berkeley Sound, *Hooker*; Port Stanley, *Hohenacker*, *Abbott*. W. Falklands; West Point Island, Roy Cove, *Vallentin*.

Distrib. Fuegia, Falkland Islands, Kerguelen.

This is the plant referred to *R. Gaimardi*, Gaud., by Hooker & Harvey in 'Flora Antarctica.' J. Agardh refused this identification and described Hooker's plant as a new species—*R. Hookeriana*. It is not certain whether Agardh was justified in this, as the species of the genus are well known to vary at different seasons of the year. The original material also of *R. Gaimardi* requires to be re-examined.

With regard to the synonym *L. tenuis*, my thanks are due to Madame Weber van Bosse for allowing me to examine Kützing's specimen. Its identity is clear enough, but a difficulty arose as to nomenclature, since the exact date of publication was not easy to ascertain, and copies of Kützing's paper are exceedingly scarce. I am indebted to Mr. Gepp for drawing my attention to a reference in Hedwigia (xxxii. p. 333), which showed that the paper was published in the 'Programme der Realschule zu Nordhausen' in 1863, and to Madame Weber, who at the same moment confirmed the date by means of a separate copy in the library of the Botanical Society of Holland. As Agardh's name, which was published in the same year, is well known and has been generally accepted, and, as Kützing's has always been uncertain, the former should unquestionably be adopted.

L.? Gaimardi, *De Toni, Syll. Alg.* iv. p. 858. *Rhodomela Gaimardi*, Ag. Sp. i. p. 380 (*non* Mont., *nec* Hook. f. et Harv.).

Falkland Islands, *Gaudichaud*.

Distrib. Falkland Islands.

See note under *L. Hookeriana*.

L. patula, *De Toni, Syll. Alg.* iv. p. 859. *Rhodomela patula*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 264; Fl. Ant. ii. p. 481, tab. 183. fig. 4.

E. Falklands; Port William, Berkeley Sound, *Hooker*.

Distrib. Fuegia, Falkland Islands, Kerguelen.

Polysiphonia anisogona, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 265; *Fl. Ant.* ii. p. 478, tab. 182. fig. 2.

E. Falklands; Berkeley Sound, *Hooker*. W. Falklands; Roy Cove, *Vallentin*; West Point Island, *Vallentin*, *Hennis*.

Distrib. Fuegia, Falkland Islands, S. Georgia, Kerguelen.

Apparently common and very variable. Mrs. Vallentin's specimens show that the species attains a considerable size, and that Hooker's type-specimens

are merely fragments. The plant bears a strong resemblance to *P. urceolata* of the Northern Hemisphere, especially in its elongated growth and slender, persistently uncorticated branches, which, however, consist of 12–14 instead of 4 tubes.

An examination of Hooker's specimen of *P. atro-rubescens* shows that the Falkland Islands record of this species is an error, the plant being clearly a small example of the present species.

Polysiphonia fusco-rubescens, *Hook. f. et Harv. in Fl. Ant.* ii. p. 478, tab. 182. fig. 1.

E. Falklands, *Sulivan.*

Distrib. Falkland Islands.

A rare and little-known plant, and not recorded since the time of Hooker.

Pteronia pectinata, *Schmitz in Engl. & Prantl, Natürl. Pflanzenfam.* Teil i. Abt. 2, p. 452. *Dasya pectinata*, Hook. f. et Harv. in Fl. Ant. ii. p. 482; Harv. Nereis Austral. p. 67, tab. 27.

E. Falklands, *Hooker.*

Distrib. Fuegia, Falkland Islands, S. Georgia (teste *Reinsch*), S. Orkneys.

See notes by Mr. & Mrs. Gepp ('12, p. 81).

Herposiphonia Sulivanæ, *Falk. Rhodomelaceen*, p. 315. *Polysiphonia Sulivanæ*, Hook. f. et Harv. in Fl. Ant. ii. p. 479, tab. 182. fig. 4.

E. Falklands, *Hooker.* W. Falklands; West Point Island, *Vallentin.*

Distrib. Falkland Islands.

Bostrychia Hookeri, *Harv. in Lond. Journ. Bot.* iv. (1845) p. 269. *Stictosiphonia Hookeri*, Harv. in Hook. f. Fl. Ant. ii. p. 483, tab. 186. fig. 2.

E. Falklands; Port William, Berkeley Sound, *Hooker*; Port Stanley, *Abbott.* W. Falklands; Roy Cove, *Vallentin.*

Distrib. Fuegia, Falkland Islands.

Several fine tetrasporic specimens were collected by Mrs. Vallentin on rocks near high-water mark in the neighbourhood of fresh-water. The plant sent out by Hohenacker under this name is doubtful.

B. vaga, *Hook. f. et Harv. in Lond. Journ. Bot.* iv. (1845) p. 270. *Stictosiphonia vaga*, Hook. f. et Harv. in Fl. Ant. ii. p. 484, tab. 186. fig. 1.

E. Falklands; Port Stanley, *Hohenacker.*

Distrib. Kerguelen, Falkland Islands (?).

A small species described by Hooker & Harvey from Kerguelen and distributed by Hohenacker (No. 291) from Port Stanley. The Falkland

Islands specimen is apparently correctly named, but it may be noted that his Chiloe specimen is not *Bostrychia* but a *Gelidium*.

Bostrychia intricata, *Mont. in C. Gay, Fl. Chilena*, viii. p. 309.
Falkland Islands, *D'Urville*.
Distrib. Falkland Islands, Chile.
Hariot notes that this species is allied to *B. Hookeri*, and it is possible that the two are synonymous.

Heterosiphonia Berkeleyi, *Mont. Prodr. Phyc. Antarct.* p. 4. *Polysiphonia Davisii*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 267; Fl. Ant. ii. p. 481.
Falkland Islands, general, *Hooker*, *Abbott*, *Vallentin*, *Hennis*.
Distrib. Fuegia, Falkland Islands, Kerguelen, Auckland Island.

Var. squarrosa (*Kütz.*), *Cotton*, comb. nov. *Polysiphonia squarrosa*, Kütz. Spec. p. 822; De Toni, Syll. Alg. iv. p. 939, sub *P. atro-rubescens*.
Distrib. Probably same as type.
The original specimen of *P. squarrosa*, Kützing, which Madame Weber was kind enough to lend me, shows that it is a *Heterosiphonia*, being the not uncommon squarrosely-branched plant which is usually regarded as a form of *H. Berkeleyi*. I have little doubt that this view is correct, as several other sublittoral plants assume a very similar form under certain conditions. In reducing the plant to varietal rank Kützing's name is retained, though it should be pointed out that the alga is in no way related to *Heterosiphonia squarrosa* (Hook. f. & Harv.), De Toni, from New Zealand.

H. polyzonioides, *J. Ag. Till Alg. Syst.* xi. (1890) p. 73.
E. Falklands; Port William, coll. —— ?
Distrib. Falkland Islands.
This species (overlooked by Gain in his useful tables) was described by Agardh during his later years. The description agrees so well with *H. Berkeleyi*, var. *squarrosa*, that examination of the type will probably show that *H. polyzonioides* is identical with this plant.

Bornetia? antarctica, *De Toni, Syll. Alg.* iv. p. 1297. *Griffithsia antarctica*, Hook. f. et Harv. in Fl. Ant. ii. p. 488.
E. Falklands; Port William, Berkeley Sound, *Hooker*; Port Louis, *Moseley*. W. Falklands; West Point Island, *Vallentin*, *Hennis*. Dunmose Head, *Vallentin*.
Distrib. Fuegia, Falkland Islands; (Southern Australia?).
It is more than doubtful if the Australian plant belongs to this species.

Callithamnion Montagnei, *Hook. f. Fl. Ant.* ii. p. 490, tab. 188. fig. 2.

E. Falklands; Berkeley Sound, *Hooker*. W. Falklands; Roy Cove, West Point Island, *Vallentin*, *Hennis*.

Distrib. Fuegia, Falkland Islands.

The difference between this and the following species is not clear. The Falkland Islands Callithamnieæ are as yet very imperfectly known, and several undescribed species probably exist. Three or four plants collected by Mrs. Vallentin, also some unnamed specimens in the Kew Herbarium, are referable to *Callithamnion* or an allied genus, but being sterile cannot be determined.

C. Gaudichaudii, *Ag. Sp.* ii. p. 173.

E. Falklands, *Gaudichaud*.

Distrib. Fuegia and Falkland Islands.

C. leptocladum, *Mont. Voy. Pôle Sud*, p. 91.

E. Falklands, *Gaudichaud*.

Distrib. Fuegia and Falkland Islands.

A little-known plant.

Plumaria Harveyi, *Schmitz, in Nuovo Not.* v. (1894) p. 7. *Ptilota Harveyi*, Hook. f. in Lond. Journ. Bot. iv. (1845) p. 271; Hook. f. et Harv. in Fl. Ant. ii. p. 487, tab. 187.

E. Falklands; Cape Pembroke, *Hooker*. W. Falklands; West Point Island, *Vallentin*, *Hennis*; Roy Cove and Shallow Bay, common, *Vallentin*.

Distrib. Fuegia, Falkland Islands.

Ballia Callitricha, *Mont. in Dict. univ.* p. 442, tab. 2. *Ballia Brunonis*, Harv. in Lond. Journ. Bot. ii. (1843) p. 191, tab. 9; Hook. f. et Harv. in Fl. Ant. ii. p. 488.

Falkland Islands; general, all collectors.

Distrib. Fuegia, Falklands, S. Georgia, Marion Island, Crozets, Kerguelen, Southern Australia, New Zealand, Auckland Island.

Abundant in the Falkland Islands and widely distributed in the sub-antarctic.

B. scoparia, *Harv. Phyc. Austr.* tab. 168. *Callithamnion scoparium*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 273; Fl. Ant. ii. p. 490, tab. 189. fig. 3.

E. Falklands; Berkeley Sound, *Hooker*; Port Stanley, *Abbott*. W. Falklands; Fox Bay, *Vallentin*.

Distrib. S. Chile, Fuegia, Falklands, Southern Australia, New Zealand, Auckland Island.

A much less common species, and with a more restricted distribution.

Antithamnion flaccidum, *De Toni, Syll. Alg.* iv. p. 1414. *Callithamnion flaccidum*, Hook. f. et Harv. in Lond. Journ. Bot. iv. (1845) p. 273; Fl. Ant. ii. p. 490, tab. 188. fig. 1.

W. Falklands; West Point Island, Roy Cove, *Vallentin*.

Distrib. Fuegia, Falkland Islands; (New Zealand?).

New to the Falkland Islands. The irregular branching noted by Hooker & Harvey is shown to a remarkable extent, but there can be no doubt that these authors were correct in referring all plants to one species. The New Zealand plant, known under the name of *A. flaccidum*, will probably prove to be a distinct species.

Ceramium rubrum, *Ag. Sp.* ii. p. 146; *Hook. f. et Harv. in Fl. Ant.* ii. p. 488.

Falkland Islands, general, all collectors.

Distrib. Cosmopolitan.

Found abundantly in the W. Falklands by Mrs. Vallentin, and represented in a variety of forms in all collections.

C. diaphanum, *Roth, Cat. Bot.* iii. p. 154; *Hook. f. et Harv. in Fl. Ant.* ii. p. 488.

E. Falklands, *Hooker*. W. Falklands; Shallow Bay, *Vallentin*.

Distrib. Probably cosmopolitan.

Dr. H. E. Petersen of Copenhagen has been kind enough to examine Mrs. Vallentin's diaphanous *Ceramia*, and he is of opinion that, with the exception af one specimen, they should all be referred to *C. diaphanum*.

C. strictum, *Grev. et Harv. in Harv. Phyc. Brit.* p. xi, tab. 334.

E. Falklands (teste *Agardh*). W. Falklands; Shallow Bay, *Vallentin*.

Distrib. Probably cosmopolitan.

Rhodochorton membranaceum, *Magnus, Bot. Erg. Nordseef.* p. 67, tab. 2. figs. 7–15; *Kuckuck, Beitr.* ii. pp. 13–24, figs. 1–7.

W. Falklands; West Point Island, *Hennis*, Dunmose Head, *Vallentin*.

Distrib. N. Atlantic (Europe and America).

The first record of the genus for the islands. The present species is endozoic, and occurred in the Hydroid zoophyte, *Sertularella polyzonias* (Linn.), a species which is almost cosmopolitan in its distribution. At first it seemed as though the alga differed from the well-known Atlantic form in

the very short sporangial stalk, but Kuckuck in his detailed account shows that both long and short stalked forms occur, and sometimes on the same individual.

Hildenbrandtia Le-Cannelieri, *Hariot, in Journ. de Bot.* i. (1887) p. 74 ; *Algues Cap Horn*, p. 81, pl. 6. figs. 3 & 4.

W. Falklands ; Roy Cove, *Vallentin.*

Distrib. Fuegia, Falklands, Graham Land.

This remarkable plant, first described by Hariot in 1887, appears to be frequent in brackish localities in the Cape Horn region. Mrs. Vallentin states that it was found "growing in abundance at high-water mark up Roy Cove Creek, where the water is brackish," and Hariot comments on its widespread distribution in Fuegia.

Corallina officinalis, *Linn. Faun. Suec.* ed. 2, p. 528, no. 2234.

E. Falklands, *Darwin.* W. Falklands ; St. George's Sound, Roy Cove, *Vallentin.*

Distrib. General in N. and S. temperate seas, also in the Arctic Sea and tropical S. America.

Not a single species of *Corallina* is listed in 'Flora Antarctica,' though it is now known that several species flourish in the Magellan region, and there is a specimen collected by Darwin in the Hooker herbarium. Mrs. Vallentin's gatherings consisted of the short high-water form known as var. *mediterranea*, and she notes that the plant is scarce.

C. pilulifera, *Post. et Rupr. Illustr.* p. 20, tab. 40. fig. 101 ; *Yendo, Cor. Vercæ Japan*, p. 30, tab. 3. figs. 14–16 (1902).

W. Falklands; Fox Bay, West Point Beach, *Vallentin.*

Distrib. Pacific coasts of N. and S. America, Japan, Fuegia, New Zealand.

For the addition of this species to the Magellan region list I am indebted to Prof. K. Yendo, who, being well acquainted with the plant in the North Pacific, readily recognized the Falkland Island specimens. *C. pilulifera* is much confused in herbaria, and is found under *C. squamata*, *C. officinalis*, and *C. armata*. For its distinctive features, see Yendo, *l. c.*

Amphiroa charoides, *Lamx. Pol. flex.* p. 310. *A. cyathifera*, Hariot, Cape Horn, p. 86 (*non* Lamx.).

Falkland Islands, *Freycinet.*

Distrib. Australia (southern shores only ?).

Professor Yendo, who was kind enough to look up the 'Uranie' specimen during his visit to Paris, writes that it should be referred to *A. charoides*

rather than *A. cyathifera*. He adds that Harvey's exsicc. no. 462 is quite distinct from the true *A. charoides*.

AMPHIROA sp.

West Falklands; Roy Cove, West Point Island, *Vallentin*.

A species very distinct from the last was found by Mrs. Vallentin in two localities. Both gatherings unfortunately are sterile, but it is allied to the North Pacific *A. tuberculosa*, Aresch. As it is clearly an addition to the flora, and being the second record only of the genus, it appears to be worthy of notice.

MELOBESIEÆ.

By Mme. PAUL LEMOINE.

Les Mélobésiées recueillies aux Iles Falkland en 1910 par Mrs. Vallentin constituent une petite collection fort intéressante; j'y ai reconnu sept espèces, dont une espèce est nouvelle; ce sont :—

Lithothamnium antarcticum (Hook. f. et Harv.), Heyd.
„ *Patena* (Hook. f. et Harv.), Fosl.
„ *Schmitzii* (Hariot), Heyd.
„ *neglectum*, Foslie (= *L. variabile*, Fosl.).
„ *falklandicum*, Foslie.
Pseudolithophyllum discoideum (Fosl.), Lemoine.
Epilithon Vallentinæ, Lemoine, sp. nov.

On connaissait jusqu'ici six espèces de Mélobésiées aux Iles Falkland; Mrs. Vallentin en a retrouvées cinq. Le *Lithothamnium fuegianum* n'a pas été rencontré par elle; mais elle a recueilli de plus deux espèces nouvelles pour la région : *Epilithon Vallentinæ*, espèce nouvelle, et *Lithothamnium Patena*, qui paraît être, aux Iles Falkland, à la limite de son aire d'extension.

Comme il n'a encore été recueilli que peu d'espèces et peu d'échantillons des régions subantarctiques j'insisterai spécialement, à propos de la description des échantillons recueillis par Mrs. Vallentin, sur quelques espèces dont je n'avais pas eu connaissance lors de la rédaction de mon précédent mémoire (Lemoine, 1913) sur les algues calcaires des régions antarctiques.

LITHOTHAMNIUM ANTARCTICUM, *Heydr. in Engler's Bot. Jahrb.* xxviii. (1901) p. 544; *Lemoine, Rév. Mélob. Ant.* p. 15. *Melobesia verrucata*, var. *antarctica*, Hook. f. et Harv. in Fl. Ant. ii. p. 482.

E. Falklands, *Hooker*; W. Falklands, *Vallentin*.

DISTRIB. Voir l'espèce suivante.

Cette espèce est représentée par des échantillons, pourvus des deux sortes de conceptacles, ayant poussé sur *Ballia*, *Corallina* et *Codium mucronatum*.

Lithothamnium Patena, *Heydr. in Engler's Bot. Jahrb.* xxviii. (1901) p. 542. *Melobesia Patena*, Hook. f. & Harv. Nereis Austr. p. 111. (Pl. 9. fig. 1.)

W. Falklands, *Vallentin.*

Distrib. Sud de l'Australie, N. Zélande, Cap de Bonne Espérance, Ile Auckland.

Parmi les échantillons épiphytes dont la plupart appartiennent au *L. antarcticum*, il en existe quelques-uns vivant sur *Ballia*, qu'il faut attribuer au *L. Patena*. La question de l'individualité des trois espèces *L. lichenoides*, *L. antarcticum*, *L. Patena* a été posée par de nombreux auteurs. En dernier lieu Foslie les avait réunies et j'ai rappelé son opinion (1911, p. 130). Mais depuis (1913, p. 17), j'ai pu solutionner en partie la question en montrant les différences très nettes qui permettent de séparer *Lithothamnium antarcticum* et *Lithophyllum lichenoides*. Malgré son aspect si caractéristique l'individualité du *L. Patena* est une question plus difficile à trancher; cette question a déjà été posée par Harvey et Rosanoff, qui se sont demandés si *L. Patena* n'était pas une variété de *L. antarcticum*. En réalité, par l'étude de la structure anatomique, je crois qu'il faut considérer *L. Patena* comme une espèce très voisine de *L. antarcticum* et constituant plutôt une espèce de transition entre *Lithothamnium antarcticum* et *Lithophyllum lichenoides*.

L'aspect des échantillons typiques de *L. Patena* et de *L. antarcticum* est assez différent : *L. Patena* se présente sous l'aspect d'écussons de forme ovale ou orbiculaire, fixés seulement à la base ; la surface est rose et brillante et le contour de la fronde très entier. *L. antarcticum* forme des croûtes toujours plus adhérentes, de couleur grisâtre et terne, le contour est irrégulier ; la forme des thalles est oblongue, plus ou moins allongée.

La structure de chacune des deux espèces est en rapport avec l'adhérence plus ou moins grande de la fronde. Dans le *L. antarcticum* la croûte, généralement adhérente dans sa plus grande partie, est constituée par un hypothalle et un périthalle ; mais vers les bords, la croûte est libre et n'est pour ainsi dire constituée que par l'hypothalle (voir 1913, fig. 3). Les croûtes de *L. Patena* sont toujours complètement libres de toute adhérence ; aussi, en coupe, sont-elles constituées en majeure partie par l'hypothalle, se prolongeant à la partie supérieure aussi bien qu'à la partie inférieure par quelques plus petites cellules formant deux périthalles peu développés (Pl. 9. fig. 1).

Dans le *L. antarcticum* l'hypothalle n'est constitué que par trois à quatre files cellulaires dont les cellules mesurent 13 à 21 μ et ne dépassent pas cette dimension ; dans la *L. Patena*, les cellules de l'hypothalle mesurent 14 à 31 μ, en général 18 à 27 μ. On remarque de plus que les cellules ont une tendance très nette à se disposer en rangées concentriques (Pl. 9. fig. 1), ce que je n'ai pas observé jusqu'ici dans le *L. antarcticum* ; c'est par ce caractère que *L. Patena* se rapprocherait de *L. lichenoides* dont l'hypothalle est constitué par une série de rangées concentriques en éventails (1911, fig. 60).

Le périthalle est formé de cellules mesurant 10 à 15 μ de longueur et 6 à 8 μ de largeur dans le *L. antarcticum* et de cellules de 5 à 10 μ de longueur dans le *L. Patena*.

Les conceptacles, assez semblables comme forme, ne dépassent pas 700 μ (500 à 700 μ) dans les échantillons typiques de *L. antarcticum* et atteignant jusqu'à 1000 μ (500 à 1000, plus souvent 600 à 850) dans le *L. Patena*. Les conceptacles à sporanges sont bas, en forme de disque, de forme ronde dans *L. antarcticum* et, au contraire, de forme souvent ovale dans *L. Patena* ; les conceptacles à cystocarpes sont coniques dans les deux espèces, mais plus élevés dans *L. Patena*.

Or, si les échantillons de Mrs. Vallentin doivent être rapportés à *L. Patena* par leur structure, il est à remarquer que les conceptacles à sporanges mesurent 450 à 600 μ de diamètre et les conceptacles à cystocarpes 550 à 600 μ ; d'autres conceptacles, de plus petite taille, mais de même forme que les conceptacles à cystocarpes mesurent 350 à 450 μ, ce sont sans doute les conceptacles à anthéridies.

En résumé, les quelques échantillons des Iles Falkland que je rapporte au *L. Patena* ont des conceptacles de dimensions plus faibles que les échantillons typiques, et ils sont beaucoup moins développés que ceux qui proviennent d'Australie. *L. Patena* se trouve, aux Iles Falkland dans une localité extrême de son aire d'extension et les échantillons deviennent intermédiaires entre *L. Patena* et *L. antarcticum*. D'ailleurs des échantillons de l'Herbier Bornet provenant de l'Ile Auckland, c'est à dire également d'une localité située à la limite de son aire d'extension, sont de même mal développés.

L. antarcticum est caractéristique des régions subantarctiques (Terre de Feu, Détroit de Magellan, Cap Horn, Iles Falkland, Orcades, Géorgie, Kerguelen, Ile Auckland) et n'est connu, en dehors de ces régions, qu'en Tasmanie et dans le Sud de l'Australie. *L. Patena* est, au contraire, une espèce australe (Sud de l'Australie, N. Zélande, Cap de Bonne Espérance) et paraît fort rare dans les régions subantarctiques où il n'est connu qu'à l'Ile Auckland (Algæ Muellerianæ) et grâce à Mrs. Vallentin aux Iles Falkland ; dans ces deux dernières localités il s'y trouve en médiocre état de développement. Enfin *Lithophyllum lichenoides* est une espèce des régions tempérées et chaudes surtout de l'hémisphère Nord.

Lithothamnium Schmitzii, *Heydr. Engl. Botan. Jahrb.* xxviii. (1901) p. 541 ; *Lemoine, Rév. Mélob. Ant.* p. 25. *Lithophyllum Schmitzii*, Hariot, in Journ. de Bot. ix. (1895) p. 98. *Lithothamnion magellanicum*, Fosl. New or Crit. Lith. p. 8, fig. 8. *Lithothamnion scutelloides*, Heyd. Exp. Ant. Belge, p. 563.

E. Falklands, Berkeley Sound, *Hooker* ; W. Falklands, *Vallentin*.

Distrib. Espèce caractéristique des régions subantarctiques de l'Atlantique, depuis le Détroit de Magellan jusqu'aux Orcades.

L. Schmitzii forme, sur coquilles de *Patella*, des croûtes peu adhérentes pourvues des deux sortes de conceptacles. Les échantillons rappellent beaucoup ceux de la Terre de Feu récoltés par l'Expédition Charcot.

Cette espèce vivait dans la zone littorale ; il en est de même à la Terre de Feu ; aux Orcades elle a été signalée dans la région sublittorale.

Lithothamnium neglectum, *Fosl. Die Lith. Deutsch. Südp. Exped.* p. 207 ; *Lemoine, Rév. Mélob. Ant.* p. 14. *L. Mülleri*, Rosanoff, f. *neglecta*, Fosl. Schwed. expéd. Magellan, p. 69. *L. variabile*, Fosl. *l. c.* (Pl. **9**. fig. 2 ; Pl. **10**. figs. 3–6.)

E. Falklands, *Skottsberg*. W. Falklands, *Vallentin*.

Distrib. Ile Kerguelen, Iles Falkland. L'espèce paraît abondante dans ces deux localités. A l'Ile Kerguelen elle est représentée en dehors des échantillons typiques par une variété à feuilles très minces : var. *fragilis* Fosl.

En étudiant les échantillons de Mrs. Vallentin qui correspondent très exactement à la description du *L. variabile* des Iles Falkland, je me suis aperçue que ces échantillons pourraient également rentrer dans l'espèce *L. neglectum* de l'Ile Kerguelen et, après comparaison des caractères de ces deux espèces, il m'a paru préférable de les réunir. En effet l'aspect de ces deux espèces, chacune assez variable, est fréquemment semblable ainsi qu'on pourra s'en convaincre en comparant les photographies données par l'auteur de l'espèce (*L. variabile*, voir Foslie, Antarct. & Subant. Corallin. pl. 1. fig. 7. *L. neglectum*, voir Foslie, Die Lithoth. Deutsch. Südp. Exped. pl. 20. fig. 7).

Il faut noter comme analogies : l'épaisseur des croûtes, les dimensions des cellules, les dimensions des conceptacles à sporanges et à cystocarpes, l'aspect du tissu constitué surtout par l'hypothalle dans les deux espèces. Je ne relève comme différences que le nombre des canaux du toit des conceptacles à sporanges au nombre de 70 à 90 dans l'espèce *L. variabile* et de 50 dans *L. neglectum* ; d'autre part la présence de nouvelles formations cellulaires dans les conceptacles vides de *L. neglectum*, après l'expulsion des sporanges.

Quant au nombre des canaux il faudrait s'assurer si le chiffre de 50 canaux indiqué par Foslie pour *L. neglectum* de Kerguelen n'aurait pas été relevé sur des conceptacles jeunes ; j'ai observé ce même chiffre dans les conceptacles à sporanges jeunes de l'Ile Falkland.

L. neglectum est représentée, dans les récoltes de Mrs. Vallentin, par de nombreux thalles vivant sur coquilles de *Patella* et de *Fissurella* *. Ces thalles sont formés de sortes de petites lamelles de 1 à 4 cm. de diamètre, adhérentes dans leur partie centrale et libres à la périphérie où elles sont recourbés vers le substratum (Pl. **10**. figs. 3 et 4). Les divers échantillons sont assez

* La présence du *L. neglectum* sur les coquilles de Patelles indique qu'il a été recueilli dans la zone littorale.

différents les unes des autres, les lamelles sont très variables de taille ; lorsqu'elles sont très petites avec les bords recourbés au-dessus d'elles, l'espèce prend un aspect frisé.

Ces lamelles poussent les unes au-dessus des autres formant, dans certains cas, des thalles de plusieurs centimètres d'épaisseur (Pl. **10**. fig. 5). Le bord de la croûte est généralement épaissi dans cette espèce et très entier.

J'ai également rapporté à cette espèce une croûte très adhérente, couverte de conceptacles à cystocarpes et recouvrant en grande partie une coquille de *Patella* (Pl. **10**. fig. 6) ; au premier aspect l'échantillon paraît très différent de celui de *L. neglectum*, dont il a cependant la même structure et les mêmes conceptacles ; mais on remarque, sur les bords de cette croûte adhérente, le début de la formation de lamelles (à droite sur la figure) ; aussi faut-il penser que ce thalle a vécu dans des conditions de vie défectueuses qui ont modifié son aspect habituel et empêché la constitution des lamelles. D'ailleurs M. Foslie avait déjà signalé que le *L. neglectum*, str. sensu, formait quelquefois une croûte adhérente.

Les thalles de *L. neglectum* recueillis par Mrs. Vallentin sont couverts de conceptacles.

Les conceptacles à sporanges sont à peine surélevés au-dessus de la surface du thalle ; leur toit est plat ; leur diamètre est de 400 μ lorsqu'ils sont de forme circulaire, et de 400 μ × 300 μ ou 400 μ × 500 μ lorsqu'ils sont de forme ovale ; le toit est percé de 70 à 80 pores. Je n'ai pas observé de dimension supérieure à 550 μ, bien que l'auteur de l'espèce M. Foslie leur assigne comme dimension 400 à 600 μ.

Les conceptacles à cystocarpes ont sensiblement la même dimension que les précédents ; ils ont 400 μ en moyenne, les plus jeunes mesurent 300 à 350 μ et quelques-uns atteignent 450 à 500 μ. Les carpospores mesurent environ 125 μ.

La croûte a une épaisseur de 230 à 330 μ lorsqu'elle forme les lamelles ; exceptionellement, lorsqu'elle est adhérente elle atteint 350 μ d'épaisseur et même 600 μ au niveau des conceptacles ; elle est presque uniquement constituée par l'hypothalle dont l'épaisseur est d'environ 100 à 150 μ ; il est constitué par des files extrêmement serrées, étroites et rigides, difficiles à distinguer les unes des autres ; les cellules, étroites et longues mesurent 20 à 40 μ de longueur ; dans les échantillons en lamelles la dimension moyenne est plutôt de 25 à 32 μ et dans les échantillons adhérents elle est plutôt de 30 à 37 μ ; la largeur est toujours d'environ 7 à 8 μ.

A la partie supérieure de la croûte on remarque un périthalle très réduit composé de quelques cellules formant des files lâches ; mais, dans certains échantillons, le périthalle est un peu plus épais et est alors constitué par des rangées superposées ; par ce caractère *L. neglectum* doit plutôt appartenir à ce que j'ai appelé la Section V. des *Lithothamnium* tandis que je l'avais précédemment rangé parmi les espèces de la Section II. ; mais il faut toutefois

faire cette restriction que ce caractère n'apparaît que sur des croûtes d'une certaine épaisseur.

Les cellules du périthalle mesurent 10 à 16 μ de longueur et 5 à 8 μ de largeur.

J'ai insisté sur cette espèce dont les conceptacles à cystocarpes étaient encore inconnus et dont je n'avais pas eu l'occasion d'étudier les échantillons des Falkland (sub *L. variabile*) dans mon précédent mémoire (1913, pp. 14 et 30).

Lithothamnium fuegianum, *Fosl. Alg. Not.* ii. p. 9 (non *Heydr.*). *L. kerguelenum*, Fosl., var. *fuegiana*, Fosl. Schwed. exped. Magellan, p. 69; Lemoine, Rév. Mélob. Ant. p. 29.

E. Falklands: Berkeley Sound, *Skottsberg*.

Distrib. Terre de Feu, Iles Falkland.

Lithophyllum falklandicum, *Fosl. Alg. Not.* ii. p. 24; *Ant. & Subant. Corall.* p. 14, pl. ii. figs. 10–13; *Lemoine, Rév. Mélob. Ant.* p. 34.

E. Falklands: Berkeley Sound, Stanley Harbour, Port Louis, Seal Cove, *Skottsberg*; W. Falklands, *Vallentin*.

Distrib. Cette espèce n'a pas été signalée ailleurs qu'aux Iles Falkland.

Cette espèce est représentée par un seul échantillon sur coquille de *Chiton*. Il est formé d'une croûte mince surmontée de petites nodosités; elle est à un stade encore jeune et elle n'est encore constituée que par le premier tissu, le périthalle primaire. Les conceptacles forment de petits granules convexes, ainsi qu'il est de règle chez cette espèce.

Pseudolithophyllum discoideum, *Lemoine, Rév. Mélob. Ant.* p. 46. *Lithophyllum? discoideum*, Fosl. Schwed. exped. Magellan, p. 73. (Pl. **10**. figs. 1 & 2.)

E. Falklands, *Skottsberg*; W. Falklands, *Vallentin*.

Distrib. Espèce caractéristique de la région subantarctique de l'Atlantique: Terre de Feu, Ile des États, Iles Falkland.

Cette espèce est représentée par des croûtes jeunes, de forme circulaire, ayant déjà une assez grande épaisseur et vivant sur coquille de Patelle (Pl. **10**. fig. 1). Un autre échantillon ayant poussé sur rocher est beaucoup plus développé; il forme une croûte basilaire de laquelle s'élèvent des croûtes verticales (Pl. **10**. fig. 2). Tous les échantillons sont couverts de conceptacles qui apparaissent comme de petits points clairs à la surface du thalle et forment ensuite des alvéoles enfoncées dans le thalle. Les échantillons recueillis par Mrs. Vallentin proviennent de la zone littorale; cette espèce a été également recueillie précédemment dans la zone sublittorale.

Epilithon Vallentinæ, *Lemoine*, sp. nov. (Pl. **9**. figs. 3 & 4.)

Crustæ tenuissimæ, primum orbiculares, dein gradatim confluentes et ambitu indeterminatæ, 10–20 μ crassæ, pagina inferiore omnino ad matricem

adnata, paululum calce induratæ, margine lobatæ, mono- vel di-stromaticæ : cellulæ irregulares, subquadraticæ, 3–10 μ longæ, 3–5 μ latæ, et e superficie visæ 14–17 μ longæ, 4–6 μ latæ, dense seriatæ ; conceptacula sporangifera 350–400 μ diam., centro deplanata, cærposporifera fere convexa centro leviter deplanata, 200–270 μ diam.

Falklands ; in *Delesseria Lyallii*, *Vallentin*.

Cette espèce forme de petites croûtes, d'abord isolées, et ensuite confluentes, extrêmement minces, recouvrant les frondes de *Glossopteris Lyallii* (Pl. **9**. fig. 4) ; l'aspect est très analogue à celui de notre espèce européenne, *E. membranaceum*, de couleur un peu plus rose ; la croûte, lobée aux bords, n'a qu'une épaisseur de 10 à 20 μ. Elle est composé de une ou deux rangées de cellules, petites, de forme irrégulière, et se colorant mal par les réactifs ; la rangée inférieure est composée de cellules de 3 μ de hauteur et 5 μ de largeur ; la rangée supérieure de cellules de 5 à 10 μ de hauteur et 5 μ de largeur. Lorsqu'on observe la thalle à plat, les cellules paraissent disposées en files étroites, rigides, très serrées, et mesurent 14 à 17 μ de longueur et 4 à 6 μ de largeur (Pl. **9**. fig. 3).

Les conceptacles, peu nombreux, sont disséminés ça et là sur le thalle ; les conceptacles à sporanges, peu apparents, montrent une partie centrale déprimée entourée d'un rebord peu élevé ; le diamètre est de 350–400 μ ; les conceptacles à cystocarpes sont peu élevés, ils sont légèrement coniques, et déprimés au sommet, ils mesurent 200 à 270 μ de diamètre.

Le genre *Epilithon* ne renferme qu'un petit nombre d'espèces ; les différences qui séparent *E. Vallentinæ* des autres espèces sont faciles à indiquer. Je n'insisterai, parmi les espèces d'*Epilithon*, que sur une espèce du Sud de l'Australie, *E. Rosanoffi*, et sur l'espèce des régions tempérées de l'Atlantique, *E. membranaceum* ; les autres espèces d'*Epilithon* sont confinées dans les régions tropicales.

E. Vallentinæ, qui vit sur *Glossopteris*, se distingue facilement de *E. Rosanoffi* qui n'est encore connu que sur *Plocamium* ; dans cette dernière espèce le thalle est beaucoup plus épais à l'endroit des conceptacles, il atteint en effet 50 μ d'épaisseur et est constitué en certaines points de 5 rangées de cellules. Les cellules vues de dessus sont beaucoup plus petites que celles de *E. Vallentinæ* : elles mesurent 9–12 $\mu \times 3\,\mu$; en coupe (Foslie, Algol. Notiser, v. 1908, p. 5), elles mesurent 7 à 14 $\mu \times 5$ à 9 μ, tandis qu'elles ne dépassent pas 10 μ dans le *E. Vallentinæ* ; les conceptacles à sporanges sont plus petits : 150 à 220 μ, leur diamètre extrême est 300 μ.

D'autre part *E. Vallentinæ* paraît assez voisin par l'aspect de *E. membranaceum* qui vit sur un grand nombre de supports. Dans cette dernière espèce, les conceptacles à sporanges ont des rebords plus élevés, et sont presque toujours de forme ovale ; leur diamètre n'est que de 110 à 175 μ, ils simulent l'aspect d'un petit cratère, sont généralement en petits groupes et sont souvent confluents. En coupe le tissu est composé de 1 à 4 rangées de

cellules ; enfin les cellules, vues de dessus, sont plus petites et plus larges : elles ne mesurent que 8 à 13 $\mu \times$ 7 à 8 μ. Les conceptacles à cystocarpes ont également un plus faible diamètre et sont plus convexes, ils mesurent 150 à 180 μ. L'espèce *E. Vallentinæ* paraît donc bien caractérisée.

La découverte d'un *Epilithon* dans les régions subantarctiques est fort intéressante. J'avais récemment (1913, p. 54) attiré l'attention sur le petit nombre relatif d'espèces épiphytes dans l'ensemble des régions antarctiques et subantarctiques, et sur l'absence complète des genres de Mélobésiées, *Melobesia* et *Epilithon*. La découverte qu'a faite Mrs. Vallentin modifie les conclusions que j'avais faites à ce sujet et a un grand intérêt.

Species Excludendæ.

Ecklonia buccinalis, *Hornem.*

A Cape plant entirely unknown in the Magellan region. The Falkland Islands record rests on a statement by Bory which was doubtless incorrect.

Punctaria lanceolatum, *Kütz.*

This species, described by Kützing from a specimen of Hooker's from Berkeley Sound, has not been since recorded. The description at once suggests *Corycus prolifer*, but Madame Weber van Bosse informs me that the type-specimen is not to be found in Kützing's herbarium. Specimens of *Corycus prolifer* from Berkeley Sound and agreeing exactly with Kützing's description occur unnamed in the Kew Herbarium, and there can be practically no doubt that it was from a duplicate of this gathering that Kützing founded his *Punctaria lanceolata*. I have therefore removed the name from the list.

Asperococcus bullosus, *Lamx.*

The old record for this (J. Agardh, Sp. i. p. 77 ; *vide* Hariot, '89, p. 44) is doubtless an error for *Adenocystis utricularis*, Skottsb.

Actinonema subtilissima, *Reinsch.* See note below.

A. tenuissima, *Reinsch.*

Both this and the last-named were founded on Falkland Islands material, but the identification of such critical forms from Reinsch's meagre description is quite impossible. The types do not appear to be in existence, hence the names may be removed from algological literature.

Porphyra Kunthii, *Kütz. Phyc. Gen.* p. 393.

I have not seen the type of this doubtful Chilean species and do not know

what it really represents ; but, in any case, Hohenacker's specimen (No. 361), on which the Falklands record is based, appears to be only a form of *P. umbilicalis*.

Gigartina pistillata, *Stackh.*

Known from a single species in herb. d'Urville (*vide* Hariot, '89, p. 69). The locality there given is probably incorrect.

Gymnogongrus implicatus, *Kütz.* (*Ahnfeltia concinna*, Hariot, Miss. Cap Horn, p. 71.)

Howe has recently gone into the question of this species, and he regards it as a variety of *Ahnfeltia Durvillæi*, J. Ag. (Howe, '14, pp. 111–114). The Falkland Islands record is based on Hohenacker, Alg. mar. exsicc. no. 181, which is incorrectly named and is probably a small specimen of *Gracilaria aggregata*.

Callophyllis tenera, *J. Ag.*

It is doubtful if this plant, described from the South Shetlands, is a good species; but, in any case, Hohenacker's Falkland record may be deleted, as his specimen No. 375 is a small thin fragment of *C. fastigiata*, J. Ag.

Rhodymenia sobolifera, *Grev.*

An error for *Callophyllis fastigiata*, J. Ag.

Chylocladia clavellosa, *Grev.*

Based on an old and very doubtful record by J. Agardh (*vide* Hariot, '89, p. 76).

Nitophyllum fuscorubrum, *Hook. f. et Harv.*

This rests on Hohenacker's Exsicc. no. 198. The species may occur in the Magellan region, but the British Museum example of no. 198 (the only one I have seen) is almost certainly referable to *N. lividum*, Hook. f. et Harv.

N. variolosum, *Hook. f.*

J. Agardh records this New Zealand species in his 'Epicrisis' (p. 453), but a specimen so named by him in the British Museum is referable to *N. laciniatum*, Hook. f. et Harv.

Delesseria hypoglossum, *Lamx.*

See Hariot, '93, p. 93. The specimen is probably *D. phyllophora*.

D. platycarpa, *Lamx.*

Recorded in error. See note under *Nitophylla Durvillei*, J. Ag., p. 182.

Laurencia pinnatifida, var. angustata, *Hook. f., Fl. Ant.* i. 184; ii. 484.

The Falkland Islands records refer to a species of *Chondria*. See p. 186.

Lophura tenuis, *Kütz.* = *Lophurella Hookeriana*, Falk. See p. 186.

Polysiphonia atrorubescens, *Grev.*

Hooker's specimen, on which this record is founded, is *P. anisogona*, Hook. f. et Harv.

P. squarrosa, *Kütz.* = *Heterosiphonia Berkeleyi*, var. *squarrosa*, Cotton.

Pollexfenia tenella, *Kütz.*

The question of *Pollexfenia tenella*, founded by Kützing on a plant said to be collected in the Falklands and received from Sir J. D. Hooker, is likely to remain for ever obscure, as Madame Weber van Bosse tells me that the specimen is not to be found in Kützing's herbarium. The genus is unknown in the Antarctic, and the locality is incorrect, hence I have removed the name from the Falkland list.

Halurus equisetifolius, *Kütz.*

Recorded by Agardh; but, as the plant is not known at all from the Southern hemisphere, doubtlers an error for *Ballia scoparia*.

Dumontia filiformis, *Grev.*

The record for this rests on Hooker's statement in 'Flora Antarctica,' ii. p. 487. An examination of the specimen at Kew and also at the British Museum shows that the plant is not a *Dumontia*, but an alga possessing a cellular structure. The specimens are old, apparently sterile and decayed, and must be left as indeterminable. New Zealand and Campbell Island material under the same cover is also found to be incorrectly named, so that there is now no evidence that *Dumontia filiformis* occurs at all in the Southern hemisphere.

III. SYSTEMATIC LIST OF FRESH-WATER ALGÆ *.

MYXOPHYCEÆ.

Chroococcus minutus, *Näg. Gatt. einz. Alg.* p. 46.

Glœothece tepidariorum, *Lagerh. Bidr. t. Sv. algfl.* p. 44, taf. 1. fig. 12.

Oscillatoria prolifica, *Gom. Oscill.* ii. p. 205, taf. 6. fig. 8.

O. sancta, *Kütz. Tab. Phyc.* p. 30, taf. 42. fig. 7.

Spirulina subtilissima, *Kütz. Phyc. gener.* p. 183; *Tab. Phyc.* i. p. 26, taf. 37. fig. 6.

Nostoc paludosum, *Kütz. Tab. Phyc.* ii. p. i, fig. 2.

* Compiled from Carlson's 'Süsswasseralgen' (1913), as explained in the Introduction, p. 138.

BACILLARIALES.

Melosira nummuloides, *Ag.* See Schmidt Atl. taf. 182. fig. 1.

Achnanthes brevipes, *Ag. Syst.* p. 1.

A. coarctata, *Grun.*, *f.* falklandica, *Carls.* p. 23, taf. 3. figs. 13, 14.

A. lanceolata, *Grun.* Cleve & Grun. Arct. Diat. p. 23.

Var. dubia, *Grun.* Cleve & Grun. Arct. Diat. p. 23.

A. Muelleri, *Carls. Süssw.* p. 23, taf. 3. figs. 5–7.

Caloneis macloviana, *Carls. Süssw.* p. 12, taf. 1. fig. 16.

C. panduriformis, *Carls. Süssw.* p. 12, taf. 1. fig. 17.

Cocconeis scutellum, *Ehrenb. Syn.* ii. p. 170.

Cymbella ventricosa, *Kütz. Bac.* p. 80, taf. 6. fig. 16.

Diatoma elongatum, *Ag. Syst.* p. 4. See *Diatoma tenue*, var. *elongatum*, Heurck, Syn. taf. 1. figs. 18, 19.

Diatomella Balfouriana, *Ag.* See Heurck, Syn. p. 161, taf. 51. figs. 10–12.

Diploneis subovalis, *Cleve, Syn.* i. p. 96, taf. 1. fig. 27.

Epithemia zebra, *Kütz.*, var. porcellus, *Grun. Œsterr. Diat.* p. 328, taf. 3. figs. 3–4.

Var. elongata, *Grun.* Cleve & Möll. Diat. no. 97.

Eunotia Nymanniana, *Grun. in Heurck, Syn.* taf. 34. fig. 8.

Fragilaria rumpens, *Grun.* taf. 2. figs. 17, 18.

Frustulia rhomboides, *Cleve, Syn.* i. p. 122.

F. vulgaris, *Cleve, Syn.* i. p. 122.

Grammatophora oceanica, *Ehrenb.* See Grun. Grammat. p. 9.

Gyrosigma attenuatum, *Rab.*, var. subbalticum, *Carls.* p. 13, taf. 2. figs. 4–6.

Navicula cryptocephala, *Kütz. Bac.* p. 94, taf. 3. fig. 26.

N. excellens, *Carls.* p. 16, taf. 1. fig. 27.

N. Kotschyi, *Grun. Neue u. ungenüg. gek. Algen*, p. 538, taf. 4. fig. 12.

N. mutica, *Kütz.*, var. producta, *Grun. in Cleve & Grun. Arct. Diat.* p. 41.

Navicula suecorum, *Carls. Süssw.* p. 15, taf. 1. fig. 27.

Nitzschia sigma, *W. Sm. Brit. Diat.* i. p. 39, tab. 13. fig. 108.

Pinnularia borealis, *Ehrenb. Verbr. u. Einfl.* taf. i. 2, fig. 6.

P. interrupta, *W. Sm., f.* stauroneiformis, *Cleve, Syn.* ii. p. 76.

P. macilenta, *Ehrenb.* Cleve, Diat. Finl. p. 24, taf. 1. fig. 7.

P. stauroptera, *Rab.*, var. interrupta, *Cleve, Syn.* ii. p. 83.

P. viridis, *Ehrenb. Infus.* p. 182.

Pseudonitzschia migrans, *Heurck, Diat. Exp. ant.* p. 23, tab. 3. fig. 44.

Rhopalodia gibberula, *O. Müll. Bac. El Kab.* p. 276.

Surirella ovalis, *De Toni, Syll.* ii. p. 579.

Synedra affinis, *Kütz.*, var. tabulata, *Heurck, Syn.* taf. 41. fig. 14.

S. fulgens, *W. Sm.*, var. mediterranea, *Grun. in Heurck, Syn.* taf. 43. fig. 3.

Trachyneis aspera, *Cleve, Syn.* i. p. 191. See Schmidt, Atl. taf. 48. figs. 2–6.

HETEROKONTÆ.

Tribonema bombycinum, *Derb. & Sol. Süssw. Alg. Schl.-Holst.* i. p. 132.

CHLOROPHYCEÆ.

Cœlastrum sphæricum, *Näg. Gatt. einz. Alg.* p. 97, taf. 5 c. fig. 1.

Glœocystis vesiculosa, *Näg. Gatt. einz. Alg.* p. 65, taf. 4.

Hormotila mucigena, *Borzi, Studi Algol.* i. p. 99, tab. 8., 9.

Pleurococcus vulgaris, *Menegh.* See G. S. West, Brit. Freshw. Algæ, p. 202, fig. 81.

Trochiscia granulata, *Hansg. Ueber Trochiscia*, p. 128.

T. hystrix, *Hansg. Ueber Trochiscia*, p. 129.

Trentepohlia polycarpa, *Nees & Mont. Voy. de la 'Bonite,'* p. 16.

Ulothrix æqualis, *Kütz. Phyc. Germ.* p. 196; *Tab. Phyc.* ii. taf. 89. fig. 1.

U. oscillarina, *Kütz. Phyc. Germ.* p. 197; *Tab. Phyc.* ii. taf. 88. fig. 1.

Prasiola crispa, *Menegh. Cenni sull' Organographia*, p. 36.

IV. SYSTEMATIC LIST OF LICHENS.

The sequence of genera is that of Darbishire's 'Lichens of the Swedish Antarctic Expedition' (1912).

Sphærophoron compressum, *Ach. Meth.* p. 135.
E. Falklands, *Gaudichaud*, *Hooker*; Port Louis, Port Stanley, *Skottsberg*. W. Falklands; Shallow Bay, *Vallentin*.
Distrib. Cosmopolitan.

S. coralloides, *Pers. in Ust. Ann.* i. (1791) p. 23.
E. Falklands, *Hooker*: Port Louis, Port Stanley, *Skottsberg*. W. Falklands; Hill Cove, Mount Cook, Roy Cove, *Vallentin*.
Distrib. Cosmopolitan.

S. tenerum, *Laurer, in Linnæa*, ii. (1827) p. 45, t. 1. fig. 4.
E. Falklands; Port Stanley, *Skottsberg*.
Distrib. Fuegia, Patagonia, S. Chile, Southern Australia.

Lecidia agellata, *Darb. Lich. Swed. Ant. Exped.* p. 4, pl. 1. fig. 3.
E. Falklands; Port Louis, *Skottsberg*.
Distrib. Falkland Islands.

L. capistrata, *Darb. Lich. Swed. Ant. Exped.* p. 3, pl. 1. fig. 2.
E. Falklands; Port Louis, *Skottsberg*.
Distrib. Falkland Islands.

L. elæochroma, *Th. Fr. Lich. Scand.* p. 542. *L. parasema*, Hook. Fl. Ant. ii. p. 539, *non* Ach.
E. Falklands; Port Stanley, *Skottsberg*.
Distrib. Cosmopolitan.

L. elata, *Schaer. Spic.* p. 137.
E. Falklands; Port Stanley, *Skottsberg*.
Distrib. Arctic regions and alpine Europe.

L. humistrata, *Nyl. Lich. Nov. Zel.* p. 146. *Biatora humistrata*, Flotow.
E. Falklands, *Lechler*.
Distrib. Falkland Islands.

L. interrupta, *Darb. Lich. Swed. Ant. Exped.* p. 3, pl. 1. fig. 1.
E. Falklands; Port Stanley, *Skottsberg*.
Distrib. Falkland Islands.

Lecidia protracta, *Darb. Lich. Swed. Ant. Exped.* p. 4, pl. 1. fig. 4.
E. Falklands, *Skottsberg.*
Distrib. Falkland Islands.

L. tenebrosula, *Müll.-Arg. in Flora*, lxix. (1886) p. 126.
E. Falklands ; Port Stanley, *Skottsberg.*
Distrib. Falkland Islands, S. Georgia.

L. xantholeuca, *Müll.-Arg. Lich. Speg.* p. 45.
E. Falklands ; Port Stanley, *Lechler*, 56.
Distrib. Falkland Islands.

Biatora macloviana, *Flotow, Deutsche Lich. Exsicc.* 61 (nomen nudum ?); *Lechler, Enumeratio*, p. 49.
E. Falklands, *Lechler.*
Distrib. Falkland Islands.
Apparently a *nomen nudum.*

Bacidia tuberculata, *Darb. Lich. Swed. Ant. Exped.* p. 5, pl. 1. fig. 8.
E. Falklands ; Port Louis, *Skottsberg.*
Distrib. Falkland Islands.

Rhizocarpon geminatum, *Th. Fr. Lich. Scand.* p. 623.
E. Falklands ; Port Louis, *Skottsberg.*
Distrib. Arctic, antarctic, and alpine regions, probably cosmopolitan.

R. geographicum, *DC. Fl. Franç.* ii. p. 366.
E. Falklands, *d'Urville, Hooker* ; Port Stanley, Port Louis, *Skottsberg.* W. Falklands ; Roy Cove, common, *Vallentin.*
Distrib. Arctic, antarctic, and alpine regions, cosmopolitan.

Stereocaulon magellanicum, *Th. Fr. Comm.* p. 31. *S. tomentosum*, var. *magellanicum*, Crombie, Lichens Nassau, p. 224.
W. Falklands ; Fox Bay, *Cunningham.*
Distrib. Fuegia.

S. turfosum, *Bory in d'Urville, Flore des Mal.* p. 596.
E. Falklands, *d'Urville.*
Distrib. Falkland Islands.
This is probably a synonym of the last.

Cladonia aggregata, *Eschw. in Mart. Fl. Bras.* i. (1833) p. 278. *Cenomyce aggregata*, Ach. ; Hook. f. Fl. Ant. ii. p. 532.
E. Falklands, *Gaudichaud, Hooker* ; Port Stanley, Port Louis, *Skottsberg.* W. Falklands ; Hill Cove, *Vallentin.*
Distrib. Mainly southern part of America, Africa, and Australia.

Cladonia cariosa, *Spreng. Syst. Veg.* iv. p. 272.
W. Falklands; Roy Cove, Shallow Bay, *Vallentin.*
Distrib. Probably cosmopolitan.

C. cervicornis, *Schaer.* p. 195.
W. Falklands; Rapid Point, Roy Cove, Mount Cook, *Vallentin.*
Distrib. Europe, Asia, Africa.
This and the last are both additions to the list.

C. coccifera, *Schaer. Spic.* p. 24. *Cenomyce coccifera*, Hook. f. Fl. Ant. ii. p. 531.
E. Falklands, *Hooker*; Port Louis, *Skottsberg.* W. Falklands; Hill Cove, in profusion, *Vallentin.*
Distrib. Probably cosmopolitan.

C. deformis, *Hoffm. Deutsch. Fl.* ii. p. 120. *Cenomyce deformis*, Ach.; Hook. f. Fl. Ant. ii. p. 531.
E. Falklands, *d'Urville*, *Hooker.*
Distrib. Probably cosmopolitan.

C. fimbriata, *Fr. Lich. Eur.* p. 222. *Cenomyce fimbriata*, Ach.; Hook. f. Fl. Ant. ii. p. 531.
E. Falklands, *d'Urville*, *Hooker.* W. Falklands; Shallow Cove, Crooked Inlet, Turkey Inlet, *Vallentin.*
Distrib. Cosmopolitan.

C. furcata, *Hoffm. Deutsch. Fl.* ii. p. 115.
E. Falklands; Port Louis, *Skottsberg.* W. Falklands; Roy Cove, *Vallentin.*
Distrib. Cosmopolitan.

C. gracilis, *Hoffm. Deutsch. Fl.* ii. p. 119. *Cenomyce gracilis*, Ach.; Hook. f. Fl. Ant. ii. p. 331.
E. Falklands, *Hooker*; Port Stanley, *Skottsberg.* W. Falklands; Mt. Cook, 800 ft., rare, *Vallentin.*
Distrib. Europe, N. & S. America, Antarctic islands.

C. macilenta, *Hoffm. Deutsch. Fl.* ii. p. 126. *Cœnomyce bacillaris*, Ach.; Hook. f. Fl. Ant. ii. p. 532.
E. Falklands, *Hooker*; Port Stanley, *Skottsberg.*
Distrib. Probably cosmopolitan.

Cladonia pycnoclada, *Nyl. Lich. Nov. Zel.* p. 244.

E. Falklands, *Gaudichaud*; Port Louis, *Skottsberg*; Roy Cove, *Vallentin.*

Distrib. Mascarenes, Brazil, Colombia, Fuegia, New Zealand.

C. pyxidata, *Fr. Lich. Eur.* p. 216.

E. Falklands, *d'Urville*, *Firmin*; Port Louis, *Skottsberg.* W. Falklands; Roy Cove, *Vallentin.*

Distrib. Cosmopolitan.

C. rangiferina, *Ach. Lich. Univ.* p. 564.

E. Falklands, *d'Urville*, *Hooker.* W. Falklands; Roy Cove, Hill Cove, *Vallentin.*

Distrib. Cosmopolitan.

C. verticillata, *Floerke*, *Clad.* p. 26.

W. Falklands; Roy Cove, *Vallentin.*

Distrib. Cosmopolitan.

Ochrolechia parella, *Massal. Ricerche*, p. 32. *Lecanora parella*, Ach.; Hook. f. Fl. Ant. ii. p. 536.

E. Falklands, *Hooker*; Port Louis, Port Stanley, Duperry Harbour, *Skottsberg.* W. Falklands; Roy Cove, *Vallentin.*

Distrib. Cosmopolitan.

O. tartarea, *Massal. Ricerche*, p. 30. *Lecanora tartarea*, Ach.; Hook. f. Fl. Ant. ii. p. 536.

E. Falklands, *d'Urville*, *Hooker*; Port Stanley, Port Louis, *Skottsberg.* W. Falklands; Fox Bay, Roy Cove, Shallow Bay, *Vallentin.*

Distrib. Europe, Asia, America.

A verruculose form, resembling *O. upsaliensis* in habit, is frequent "on bogs of *Lomaria magellanica* (=*Blechnum tabulare*, Kuhn) where camp-fires have killed the vegetation."

O. upsaliensis, *Massal. Ricerche*, p. 31. *Lecanora parella*, var. *upsaliensis*, Ach.; Hook. f. Fl. Ant. ii. p. 536. *L. macloviana*, Pers. in Gaud. Voyage, p. 97.

E. Falklands, *Gaudichaud*, *Hooker.*

Distrib. Europe, N. America.

Pertusaria alterimosa, *Darb. Lich. Swed. Ant. Exped.* p. 7, pl. 1. fig. 11.

E. Falklands; Port Louis, *Skottsberg.*

Distrib. Falkland Islands.

Pertusaria corrugata, *Darb. Lich. Swed. Ant. Exped.* p. 6, pl. 1. fig. 10.
E. Falklands ; Port Stanley, *Skottsberg.*
Distrib. Falkland Islands.

P. erubescens, *Nyl. in Lechler, Plant. Maclor.* no. 57 ; *Lich. Fueg. et Pat.* p. 22.
E. Falklands, *Lechler*, 57.
Distrib. Falkland Islands.
Both this and the next are very little known plants, and should be redescribed from the type-specimens.

P. macloviana, *Müll.-Arg. in Flora*, xlii. (1884) p. 271.
E. Falklands, *Lechler*, 54.
Distrib. Falkland Islands.

P. solitaria, *Darb. Lich. Swed. Ant. Exped.* p. 7, pl. 1. fig. 12.
E. Falklands ; Port Louis, *Skottsberg.*
Distrib. Falkland Islands.

Candelaria concolor, *Th. Fr. Lich. Scand.* p. 417. *Lecanora candelaria*, Ach. ; Hook. f. Fl. Ant. ii. p. 537. *L. laciniosa*, Nyl. in Flora, xxxix. (1881) p. 454.
E. Falklands ; on twigs of *Acæna*, Hooker.
Distrib. Probably cosmopolitan.

Xanthoria lychnea, *Th. Fr. Lich. Scand.* p. 416.
E. Falklands ; Port Louis, *Skottsberg.* W. Falklands ; Roy Cove (on gate-posts), Crooked Inlet, *Vallentin.*
Distrib. Probably cosmopolitan.

Placodium ambitosum, *Darb. Lich. Swed. Ant. Exped.* p. 18, pl. 2. fig. 13.
E. Falklands ; Port Louis, *Skottsberg.* W. Falklands ; Roy Cove, *Vallentin.*
Distrib. Falkland Islands.
Some fine material of this beautiful new species described by Darbishire in 1912 was collected by Mrs. Vallentin at Roy Cove. Known at present only from the Falkland Islands.

P. lucens, *Nyl. Lich. Nov. Zel.* p. 145. *Lecanora murorum*, var. *farcta*, Church. Bab. ; Hook. f. Fl. Ant. ii. p. 535.
E. Falklands ; Port Stanley, *Skottsberg.*
Distrib. Kerguelen, Cape Horn.

Placodium murorum, *DC. Fl. Fr.* ii. p. 378. *Lecanora murorum*, Ach.; Hook. f. Fl. Ant. ii. p. 535, excl. var.
E. Falklands, *Hooker*.

Var. miniatum, *H. Olivier, Lich. d'Eur.* p. 89. *Lecanora miniata*, Ach.; Hook. f. Fl. Ant. ii. p. 535.
E. Falklands, *Hooker*.
Distrib. Type and variety probably cosmopolitan.

Hæmatomma coccineum, *Koeber, Syst. Lich. Gen.* p. 153. *Lecanora hæmatomma*, Ach.; Hook. f. Fl. Ant. ii. p. 537.
E. Falklands, *Hooker*; Port Stanley, Port Louis, *Skottsberg*. W. Falklands; Roy Cove, Crooked Inlet, *Vallentin*.
Distrib. Europe, N. & S. America.

H. ventosum, *Massal. Ricerche*, p. 33, fig. 54. *Lecanora ventosa*, Ach.; Hook. f. Fl. Ant. ii. p. 537.
E. Falklands, *Hooker*; Port Louis, *Skottsberg*.
Distrib. Probably cosmopolitan.

Lecanora atro-violacea, *Nyl. Lich. Fueg.* p. 21.
E. Falklands, *Lechler*.
Distrib. Falkland Islands.

L. epibryon, *Ach. Syn.* p. 155. *L. subfusca*, var. *epibryon*, Ach.; Hook. f. Fl. Ant. ii. p. 536.
E. Falklands, *Hooker, Skottsberg*.
Distrib. Probably cosmopolitan.

L. erythrella, *Nyl. & Cromb. in Journ. Linn. Soc., Bot.* xx. (1883) p. 63.
E. Falklands; Port William, *Hooker*.
Distrib. Cosmopolitan.
Hooker's specimen is not to be found at Kew, and it is not certain whether the plant is the same as *L. erythrella* as at present understood.

L. frustulosa, *Ach. Lich. Univ.* p. 405.
E. Falklands; Port Stanley, *Skottsberg*.
Distrib. Europe, E. Asia, northern and alpine America.

L. subfusca, *Nyl. in Flora*, lv. (1872) p. 250.
E. Falklands, on *Acæna*, Hooker.
Distrib. Cosmopolitan.

Aspicillia lirellina, *Darb. Lich. Swed. Ant. Exped.* p. 10, pl. 2. figs. 18 & 19.

E. Falklands; Port Louis, *Skottsberg.*

Distrib. Falkland Islands.

A. orbiculata, *Darb. Lich. Swed. Ant. Exped.* p. 11, pl. 2. fig. 21.

E. Falklands ; Port Louis, *Skottsberg.*

Distrib. Falkland Islands.

Parmelia antarctica, *Bitter, in Hedwigia*, xl. (1901) p. 248, t. 10. fig. 3.

W. Falklands ; Hill Cove, *Vallentin.*

Distrib. New Zealand.

The stalk is undoubtedly hollow in some parts of the gathering, in others it is doubtful, but I have referred the specimens to *P. antarctica.*

P. Borreri, *Turn. in Trans. Linn. Soc.* ix. (1808) p. 148, t. 13. fig. 2.

W. Falklands; Shallow Bay, *Vallentin.*

Distrib. Cosmopolitan.

Several specimens with the punctate soredia typical of this species were collected. It, together with the last, is an addition to the Falklands list.

P. enteromorpha, *Ach. Meth.* p. 252 ; *Hook. f. Fl. Ant.* ii. p. 532.

E. Falklands, *Hooker, Linney* ; Port Stanley, Port Louis, *Skottsberg.* W. Falklands, *Firmin.*

Distrib. America, Australia, New Zealand.

See note under next species.

P. lugubris, *Pers. in Gaud. Flora*, p. 196.

E. Falklands, *Gaudichaud, d'Urville.* W. Falklands; Roy Cove, on *Empetrum rubrum*, common, *Vallentin.*

Distrib. Southern America, N. Asia.

For the determination of the *Hypogymnia* section of *Parmelia,* Bitter's important paper ('01) should be consulted. According to his classification the plant which Mrs. Vallentin found so plentifully on *Empetrum rubrum* is referable to *P. lugubris* rather than to *P. enteromorpha.* Probably the bulk of Hooker's material belongs to the same species, though referred by him to *P. enteromorpha.*

Several lichens are known to be carried large distances by the wind, and Mrs. Vallentin records in her note-book that this is particularly the case in the present species, owing to the thallus being so much inflated with air.

Parmelia Mougeotii, *Schaer. Enum.* p. 46.
E. Falklands; Duperry Harbour, *Skottsberg.*
Distrib. Probably cosmopolitan.

P. saxatilis, *Ach. Syn.* p. 203; *Hook. f. Fl. Ant.* ii. p. 332.
E. Falklands, *Gaudichaud*, *Hooker*; Port Stanley, Port Louis, Duperry Harbour, *Skottsberg.* W. Falklands; Roy Cove, *Vallentin.*
Distrib. Cosmopolitan.

Cetraria aculeata, *Fr. Sched. Crit.* ix. p. 32.
E. Falklands; Port William, *Lechler*, 73 & 81. W. Falklands; Mount Cook, *Vallentin.*
Distrib. All continents except Australia.

C. islandica, *Ach. Meth.* p. 293.
W. Falklands; Mount Cook, *Vallentin.*
Distrib. All continents except Australia.

Usnea angulata, *Ach. Syn.* p. 307.
E. Falklands, *Hooker.*
Distrib. Central and South America; southern Australia.
For assistance with the Usneæ I am much indebted to Miss A. Lorrain Smith. A single specimen, about one foot long, with an angular and lacunose stem, collected by Hooker, we have referred to this species.

U. articulata, *Hoffm. Fl. Germ.* p. 135. *U. barbata*, var. *articulata*, Ach.; Hook. f. Fl. Ant. ii. p. 521.
E. Falklands, *Hooker*, *Wright.* W. Falklands; Crooked Inlet, Roy Cove, Port Egmont, *Vallentin.*
Distrib. Cosmopoliton.
Miss Lorrain Smith agrees with me in referring a lax and slightly branched *Usnea* resting lightly on *Empetrum rubrum* to a form of this species. The main branches are 2–3 mm. wide, and but sparingly articulate. "Very delicate in form and colour; not common."

U. florida, *Ach. Lich. Univ.* p. 304.
E. Falklands, *Hooker.* W. Falklands; Crooked Inlet, Roy Cove, *Vallentin.*
Distrib. Cosmopolitan.
Several specimens found on a gate-post appear to be referable to dwarf forms of *U. florida*. Similar specimens found on twigs agree well with f. *denudata*, Wainio ('03, p. 10).

NEUROPOGON MELAXANTHUM, *Nyl. Syn.* p. 272.

E. Falklands, *Gaudichaud*, *d'Urville*, *Hooker*, *Cunningham*, *Linney*, *Skottsberg*. W. Falklands, several localities, *Firmin*, *Vallentin*.

DISTRIB. Arctic, antarctic, and alpine regions.

Some exceedingly fine specimens from an exposed headland on Saunders Island were brought home by Mrs. Vallentin. Hooker, who devotes considerable space to *N. melaxanthum*, remarks:—"It is in the Falkland Islands that this species most abounds, covering the surface of the quartz rocks with a miniature forest, seeking the most exposed situations, and there attaining its greatest size and beauty. In these islands, too, all the five varieties I have enumerated may be found growing within a few feet of each other, and so associated as to leave little doubt that they are states depending on age rather than marked races" (Fl. Ant. ii. p. 520).

N. TRACHYCARPUM, *Stirt. Gen.* Usnea, p. 7.

E. Falklands; Port Stanley, *Skottsberg*.

DISTRIB. Southern parts of S. America.

ALECTORIA OCHROLEUCA, *Nyl. Prodr.* p. 47.

E. Falklands, *Hooker*.

DISTRIB. Alpine regions, cosmopolitan.

A single specimen of *A. ochroleuca* was found under *Usnea barbata* in Hooker's herbarium.

RAMALINA LINEARIS, *Ach. Lich. Univ.* p. 598.

E. Falklands; Port Stanley, *Skottsberg*.

DISTRIB. Probably cosmopolitan.

Most of the old records of *R. linearis* and *R. scopulorum* refer to *R. terebrata*. Darbishire, however, who lists *R. terebrata* from Fuegia, records *R. linearis* also as gathered by Skottsberg at Port Stanley.

R. SCOPULORUM, *Ach. Lich. Univ.* p. 640; *Hook. f. Fl. Ant.* ii. p. 522, var. *α*.

E. Falklands, *Hooker*; Port Louis, *Skottsberg*. W. Falklands, *Vallentin*.

DISTRIB. Probably cosmopolitan.

One has only to refer to Miss Knowles's interesting account of the *Ramalina* vegetation and its ecology ('13, pp. 87–101) to appreciate the difficulty of naming foreign material. In spite of careful study, Miss Knowles finds it exceedingly difficult to place many of the British maritime forms according to the present classification, and she is inclined to take a wide view as to the limits of *R. scopulorum*.

R. terebrata, the common form in the Falklands, is allied to this species, but it is well marked and sufficiently distinct, until further information is

forthcoming, to be kept up as a species. Certain plants brought home by various collectors are, however, almost identical with *R. scopulorum*, and hence the species is still listed for our area.

Ramalina terebrata, *Taylor & Hook. f. in Lond. Journ. Bot.* iii. (1844) p. 654. *R. scopulorum*, var. *terebrata*, Hook. f. Fl. Ant. ii. p. 522.

E. Falklands, *d'Urville*, *Hooker*. W. Falklands, *Firmin*; Roy Cove, Crooked Inlet, Hill Cove, *Vallentin*.

Distrib. Fuegia, Graham Land.

See notes above.

Buellia discreta, *Darb. Lich. Swed. Ant. Exp.* p. 14, pl. 3. fig. 25.

E. Falklands; Port Louis, *Skottsberg*.

Distrib. Falkland Islands.

B. falklandica, *Darb. Lich. Swed. Ant. Exp.* p. 14, pl. 3. fig. 26.

E. Falklands; Port Louis, *Skottsberg*.

Distrib. Falkland Islands.

Pannaria muscorum, *Nyl. Lich. Scand.* p. 27. *Lecanora muscorum*, Ach.; Hook. f. Fl. Ant. ii. p. 534.

E. Falklands, *d'Urville*, *Hooker*.

Distrib. Probably cosmopolitan.

Psoroma paleaceum, *Nyl. Syn.* ii. p. 22. *Lecanora paleaca*, Fr.; Hook. f. Fl. Ant. ii. p. 36.

E. Falklands, *Hooker*.

Distrib. Europe; S. America.

Hooker's specimens of this species are not to be found at Kew.

P. hypnorum, *Hoffm. Fl. Germ.* ii. p. 166.

E. Falklands, *Lechler*; Port Louis, *Skottsberg*. W. Falklands, Roy Cove, Shallow Bay, Hill Cove, *Vallentin*.

Distrib. Upland regions, probably cosmopolitan.

Sticta endochrysa, *Delise*, *Genre* Sticta, p. 43, tab. 1; *Hook. f. Fl. Ant.* ii. p. 525, partim, excl. syn. *S. Lechleri*, Flot. (*non* Müll.) in Lechler, no. 65 *a*.

E. Falklands, *Gaudichaud*, *d'Urville*, *Hooker*; Port Stanley, *Lechler*, *Linney*. W. Falklands, *Firmin*; Rapid Point, Roy Cove, Crooked Inlet, *Vallentin*.

Distrib. Chile, Patagonia, Fuegia, S. Georgia.

S. endochrysa has been much confused in the past with *S. Urvillei*.

Hooker's gatherings were composed largely of the latter, and it is probable that the same applies to the earlier French records referred to above. Several very fine specimens of the true *S. endochrysa* were collected by Mrs. Vallentin.

Sticta Freycinetii, *Delise*, *Genre* Sticta, p. 124, tab. 14. fig. 51 ; *Hook. f. Fl. Ant.* ii. p. 528 (*non* i. p. 196). *S. lactucæfolia*, Pers., in Gaud. Voyage, p. 199.

E. Falklands, *Gaudichaud*, *Hooker*. W. Falklands ; Roy Cove, Crooked Inlet, Hill Cove, *Vallentin*.

Distrib. Australia, New Zealand, S. America, S. Georgia.

S. Urvillei, *Delise*, *Genre* Sticta, p. 170. *S. endochrysa*, Hook. f. Fl. Ant. ii. p. 525, partim (*non* Delise). *S. flavicans*, Hook. f. et Tayl. in Lond. Journ. Bot. iii. (1844) p. 648.

E. Falklands, *Hooker* (frequent) ; Port Stanley, Port Louis, *Skottsberg*. W. Falklands ; Rapid Point, *Vallentin*.

Var. orygmæoides, *Nyl. Syn.* i. p. 360.

W. Falklands ; Crooked Inlet, *Vallentin*.

Distrib. S. America, S. Africa, Australia, New Zealand.

Probably collected by other botanists and referred to *S. endochrysa* (see note above). For assistance with this and other species of *Sticta* I am indebted to Dr. L. W. Riddle, who has special knowledge of the group and who was on a visit to Kew when the material was being investigated.

Stictina carpoloma, *Nyl. in Flora*, xliii. (1860) p. 66 ; *Syn.* p. 339. *Sticta carpoloma*, Delise, Genre *Sticta*, p. 159. *S. gyrosa*, Flotow in Lechler, Pl. Maclov. no. 66.

E. Falklands, *Lechler*.

Distrib. Australia, New Zealand, S. America, Java, Polynesia.

It is doubtful whether this plant really occurs in the islands. Flotow's *S. gyrosa* has been referred in the past to *S. carpoloma*, but the Kew specimen of his Falkland Islands gathering must be regarded as a form of *S. Freycinetii*.

S. crocata, *Nyl. in Flora*, xliii. (1860) p. 66 ; *Syn.* p. 338.

E. Falklands, *Gaudichaud*, *d'Urville* ; Port Stanley, *Skottsberg*. W. Falklands ; Shallow Bay, *Vallentin*.

Distrib. Cosmopolitan.

S. filicina, *Nyl. in Flora*, xliii. (1860) p. 66 ; *Syn.* p. 349.

E. Falklands ; Port Louis, *Skottsberg*.

Distrib. S. America, New Zealand, Java.

Stictina Gaudichaudii, *Nyl. Syn.* i. p. 345. *Sticta malovina*, Fr. Syst. Orb. Veg. p. 283.

E. Falklands, *Gaudichaud.*

Distrib. Falklands.

According to Malme ('99, p. 12), *Sticta malovina*, Fr., is a synonym of the old *S. Gaudichaudii* of Delise.

S. gilva, *Nyl. Syn.* p. 339. *Sticta crocata*, var. *gilva*, Ach. Syn. p. 232 ; Hook. f. Fl. Ant. ii. p. 525 (excl. syn.). *Collema lanatum*, Pers. in Gaud. Flore des Malouines, p. 97.

E. Falklands, *Hooker*; Duperry Harbour, *Skottsberg.* W. Falklands; Roy Cove, *Vallentin.*

Distrib. S. Africa, Australia, Java, Fuegia.

S. intricata, var. Thouarsii, *Nyl. Syn.* p. 335. *Sticta Thouarsii*, Del. Genre *Sticta*, p. 90, tab. 8. fig. 29 ; Hook. Fl. Ant. ii. p. 527.

E. Falklands, *Hooker.*

Distrib. Europe, Africa, America.

Hooker records this from the Falkland Islands (Fl. Ant. *l. c.*), but no specimen can be found in the Kew collection.

Peltigera canina, *Schaer. Enum.* p. 20 ; *Hook. f. Fl. Ant.* ii. p. 524.

E. Falklands, on *Bolax glebraria*, Hooker.

Distrib. All continents except Australia.

The record rests on a single imperfect specimen of Hooker's ; the plant is, however, known from the adjoining mainland.

P. malacca, *Fr. Lich. Eur.* p. 44.

E. Falklands ; Port Louis, *Skottsberg.*

Distrib. Cosmopolitan.

P. polydactyla, *Hoffm. Fl. Germ.* ii. p. 106.

E. Falklands ; Port Louis, *Skottsberg.* W. Falklands ; Roy Cove, *Vallentin.*

Distrib. Cosmopolitan.

P. rufescens, *Hoffm. Fl. Germ.* ii. p. 107.

E. Falklands; Port Louis, *Skottsberg.* W. Falklands, Crooked Inlet, *Vallentin.*

Distrib. Cosmopolitan.

Verrucaria dermoplaca, *Crombie, Lichens of 'Nassau,'* p. 234.

W. Falklands ; Fox Bay, *Cunningham.*

Distrib. Falkland Islands.

Verrucaria falklandica, *Nyl. Lich. Fuegia*, p. 22.
Falkland Islands, *Rabenhorst fil.*
Distrib. Falkland Islands.
Only known from Nylander's description.

V. glaucoplacoides, *Darb. Lichens Swed. Ant. Exped.* p. 18, pl. 3. figs. 34 & 35.
E. Falklands; Port Louis, Mount Vernet, *Skottsberg.*
Distrib. Falkland Islands.

Porina confusum, *Bory in d'Urville, Flore des Malouines*, p. 595.
E. Falklands, *d'Urville.*
Distrib. Falkland Islands.

Eodocarpum maclovianum, *Bory in d'Urville, Flore des Malouines*, p. 595.
E. Falklands, *d'Urville.*
Distrib. Falkland Islands.

Thamnolia vermicularis, *Schaer. Enum.* p. 243. *Cenomyce vermicularis*, Ach., Hook. Fl. Ant. ii. p. 532.
E. Falklands, *d'Urville.* W. Falklands; Ella Hill, Roy Cove, at 500 ft., rare, *Vallentin.*
Distrib. Alpine regions, cosmopolitan.

T. undulata, *Nyl. Syn.* p. 265.
E. Falklands, *d'Urville.*
Distrib. Falkland Islands.
A little-known plant, and probably a synonym of the last.

Note on some of the Older Names.

The present position of some of the plants named by the early authors is difficult to trace. The following list gives the synonymy, as decided by various authorities, in those cases where it is not easily discoverable or otherwise obscure :—

Collema lanatum, Pers.	= Stictina gilva, Nyl.
Cornicularia flavicans, Pers.	= Neuropogon melaxanthum, Nyl.
Parmelia pubescens, Pers.	= Sticta endochrysa, Del.
Physcia sepiacea, Pers.	= Ramulina terebrata, Tayl. & Hook.
Ramalina flaccidissima, Pers.	= " " "
Sticta citrina, Pers.	= Stictina crocata, Nyl.
S. lactucæfolia, Pers.	= Sticta Freycinetii, Del.
S. Lechleri, Flot., *non* Müll.	= S. endochrysa, Del.
S. gyrosa, Flot.	= Stictina carpoloma, Del.

V. SYSTEMATIC LIST OF FUNGI.

The sequence of genera is that of Saccardo's 'Sylloge Fungorum,' except that the Discomycetes immediately follow the Pyrenomycetes.

Antennaria Robinsonii, *Mont. Syll. Crypt.* p. 290. no. 1066; *Berk. et Mont. in Hook. Lond. Journ. Bot.* ii. (1843) p. 640, tab. 24. fig. 2.

W. Falklands; on *Baccharis magellanica*, Roy Cove, *Vallentin*.

Distrib. South America, Australia, New Zealand.

The genus is new to the Falklands, and, strangely enough, in the wooded district of Fuegia, where it might have been expected, it was neither found by Hariot nor Spegazzini.

A. Robinsonii was originally described from material collected at Juan Fernandez, specimens of which exist at Kew. The diagnosis was scanty, but the plant has been recorded from many other parts of the world, including N. America, Africa, and Australia, its short growth and slender filaments marking it off from *A. scoriadea*, *Scorias spongiosa*, and other well-known southern forms. The genus *Antennaria* is badly in need of revision, and it is impossible to state the exact distribution of *A. Robinsonii* or the exact limits of the species.

The original specimens, on leaves of a fern, show a creeping, torulose, non-punctate mycelium, consisting either of very short cells hardly longer than broad or of oblong cells measuring 15–18 × 6–8 μ. The same diversity is seen in the upright branches, though the majority are of the long-celled type. The rudiments of laterally-borne perithecia are visible, but these are too young to show spores. A few stouter filaments, consisting of barrel-shaped cells 15–18 μ wide, are present. The Falkland Islands gathering, which are mostly on twigs and not on leaves, agrees well with this, but shows the velvety growth in better condition (perhaps owing to the moist climate), a fine pile of nearly black hyphæ, composed of cells of greatly varying length (15–40 μ), extending over several inches. No fruits occur, but young stages of an *Atichia* (*q. v.*) are discernible amongst the filaments.

Eurotium herbariorum, *Link, Sp. Pl.* i. 79.

W. Falklands, *Vallentin*.

Distrib. Cosmopolitan.

In the Falkland Islands, as elsewhere, this fungus frequently develops on herbarium specimens.

Atichia sp. (= *Seuratia*, Pat.).

W. Falklands; on *Baccharis magellanica*, Roy Cove, *Vallentin*.

This peculiar gelatinous genus has until recently been so little known that

the occurrence even of immature and sterile specimens in the Falklands is worthy of record. In a recent number of the 'Kew Bulletin' (1914, pp. 55–63) I have dealt with the genus in full, and given a revision of all known species; from this it will be seen that a species (possibly identical with that collected by Mrs. Vallentin) occurs in Southern Chile.

Chætomium Bacidiæ, *Darb. Lich. Swed. Ant. Exped.* p. 18, nomen nudum.

E. Falklands; Port Louis, on *Bacidia tuberculata*, Skottsberg.

Distrib. Falkland Islands.

Apparently a *nomen nudum*.

Sphærella Polygonorum, *Sacc. Syll.* i. p. 512. *Depazea Polygonorum*, Crié, Sur les *Depazea*, p. 41, tab. 8.

E. Falklands; on *Rumex Acetosella*, d'Urville, *teste* Crié.

Distrib. Europe.

Pleospora herbarum, *Rabenh. Herb. Myc.* ed. ii. p. 547.

E. Falklands; on *Senecio candicans*, d'Urville, *teste* Crié.

Distrib. Cosmopolitan.

Cordyceps militaris, *Link*, *Handb.* iii. p. 347.

W. Falklands; at the foot of Mount Cook, Roy Cove, *Vallentin*, 23.

Distrib. Europe, North America, Asia (?).

An interesting addition to the flora. After careful searching, Mrs. Vallentin succeeded in finding a number of specimens, all during the month of July. They are rather small, and the ascigerous portion is sometimes flattened; but in essential characters they agree with European specimens. The pupæ were obtained and have been submitted to the British Museum authorities, who state that they are those of one of the Hepialidæ.

Plicaria leiocarpa, *Boud. Hist. et Class. des Disc. d'Eur.* p. 50; *Icon. Mycol.* ii. pl. 304. *Peziza leiocarpa*, Currey, in Trans. Linn. Soc. xxiv. (1864) p. 493.

W. Falklands; apparently on burnt ground, *Vallentin*, 22.

Distrib. Europe.

The species agrees precisely, as far as can be seen, with European material. The type-specimens are at Kew, but authentic material was liberally distributed by Currey and specimens were sent out by Rabenhorst ('Fungi Europæi,' no. 622). Monsieur Boudier has recently redescribed and figured the plant in his magnificent 'Icones.'

Ciliaria kerguelensis, *Cotton*, comb. nov. *Peziza kerguelensis*, Berk. in Hook. f. Fl. Ant. ii. p. 451. *Lachnea kerguelensis*, Sacc. Syll. viii. p. 176.

W. Falklands; Byron Sound, *Vallentin*, 43.

Distrib. Fuegia, Falkland Islands, Kerguelen.

This species is probably widely spread in the Antarctic. The Falkland Islands specimens agree well with Hooker's Kerguelen material in the Kew herbarium, and there can be no doubt but that it is the same plant. In Kerguelen it grew on bare boggy earth near the sea, and Mrs. Vallentin's specimens occurred on the roots and stems of *Gunnera misandra* at the margins of a lagoon, and were sometimes under water owing to heavy rains.

L. kerguelensis is closely allied to *Ciliaria scutellata*, Quél., with which it agrees in its aquatic tendencies, but it differs, as Berkeley originally stated, in its broader spores and larger size. It was also collected by Hooker at Cape Horn and has been recorded from New Zealand, but the Kew examples of Berggren's New Zealand specimens have decidedly larger spores.

An enlarged and revised description based on Mrs. Vallentin's drawings and formalin material is appended.

Apothecia 1–1·5 cm., sessile, flattened, bright vermilion, beset with short, brown, pointed hairs. Excipulum rather thin, composed of large polygonal cells, bearing rhizoidal filaments and a few hairs below and passing into a subhymenial layer above, which is composed of loosely interwoven hyphæ 10–15 μ diam. Marginal hairs brown, septate or almost aseptate, pointed, rather flaccid, 400–700 μ long. Paraphyses slender, septate, branched, apices clavate, 8–12 μ thick. Asci rather long, cylindrical, 220–240 μ long, 18–20 μ wide. Spores hyaline, smooth, granular, 17–22 × 13–17 μ.

Cheilymenia stercorea, *Boud. Icon. Mycol.* ii. pl. 384. *Peziza stercorea*, Pers. Obs. ii. p. 89; Berk. in Hook. f. Fl. Ant. ii. p. 451.

E. Falklands; Port Louis, *Hooker*. W. Falklands; Roy Cove, *Vallentin*, 31.

Distrib. Probably cosmopolitan.

Any doubt that there might have been as to the correctness of Berkeley's Falkland Islands record is placed beyond dispute by the present material. It agrees precisely with British specimens and also with Boudier's figure (*l. c.*), except that the asci are slightly longer. Spegazzini notes that the species is exceedingly common on cow- and horse-dung in Fuegia ('87, p. 124).

Bulgaria arenaria, *Lév. in Ann. Sci. Nat.* sér. 3, v. (1846) p. 253. *Lycoperdon arenarium*, Pers. in Freycinet, Voy. p. 179, tab. 1. figs. 1–4.

E. Falklands, *Gaudichaud*.

Distrib. Falkland Islands.

Persoon described this plant as a Puffball, but an authentic fragment was examined by Léveillé, who found asci present and referred it to the genus

Bulgaria. Hariot was unable to procure specimens for re-examination, and the plant, though said by Gaudichaud to be plentiful on the sand-dunes in March and April, has not since been met with.

Morchella semilibera, *DC. Fl. Fr.* ii. p. 212 ; *Berk. in Hook. f. Fl. Ant.* ii. p. 451.

E. Falklands, *Hooker*.

Distrib. N. Europe, N. America.

The specimen is not to be found at Kew, and Berkeley's remarks (Fl. Ant. ii. p. 451) show that the record rests upon a very slender foundation.

Phoma Chiliotrichi, *Cotton*, sp. nov.

Perithecia sparsa, minuta, globosa, 130–170 μ diam., primum epidermate tecta, demum erumpentia, in tomento plantæ nutricæ nidulanta. Sporæ 2-guttulatæ, ellipsoideæ, utrique rotundatæ, 7–8 × 3 μ hyalinæ.

W. Falklands ; in receptaculis *Chiliotrichi amelloidei*. Roy Cove, *Vallentin*, 59.

Coniothyrium Chiliotrichi, *Cotton*, sp. nov.

Perithecia sparsa vel laxe aggregata, leviter papillata, subglobosa, 400–500 μ diam., primum epidermate tecta, demum erumpentia, in tomento plantæ nutricæ nidulanta. Sporæ numerosissimæ, eguttulatæ, ellipsoideo-globosæ, 10–12 × 8–10 μ, olivaceo-fuscæ.

W. Falklands ; in receptaculis *Chiliotrichi amelloidei*. Roy Cove, *Vallentin*, 57.

C. Baccharis-magellanicæ, *Cotton*, sp. nov.

Perithecia sparsa, vix papillata, subglobosa, minuta, 100–120 μ diam., primum epidermate tecta demum erumpentia. Sporæ numerosissimæ, eguttulatæ, subglobosæ, minutissimæ, 3–3·5 μ, hyalinæ.

W. Falklands ; in foliis *Baccharis magellanicæ*. Roy Cove, *Vallentin*, 61.

Dilophospora graminis, *Desm. in Ann. Sci. Nat.* sér. 2, xiv. (1838) p. 6.

E. Falklands ; on Gramineæ, *d'Urville*, teste *Crié*.

Distrib. Europe.

Leptothyrium decipiens, *Berk. in Hook. f. Fl. Ant.* ii. p. 449.

E. Falklands ; on *Roskowia grandiflora*, Hooker.

Distrib. Falkland Islands.

Clasterosporum ascendens, *Sacc. Syll. Fung.* iv. p. 394. *Sporodesmium ascendens*, Berk. in Ann. Nat. Hist. iv. (1840) p. 292 ; Hook. f. Fl. Ant. ii. p. 450.

E. Falklands, *Darwin*.

Distrib. Falkland Islands.

The original specimen of this is not to be found at Kew.

Lepiota granulosa, *Quél. Ench. Fung.* p. 7.
W. Falklands, June 1910, *Vallentin*, 13.
Distrib. Europe.
Excellent material in spirit was forwarded. The specimens are somewhat darker than usual, but otherwise they agree well both in external and in microscopic characters.

Mycena polygramma, *Quél. Ench. Fung.* p. 36.
W. Falklands, April 1911, *Vallentin*, 51.
Distrib. Europe.
As this fungus is usually found in connection with logs and stumps, its presence in the Falklands was hardly expected. Mrs. Vallentin's drawings clearly recalled *M. polygramma* or the allied *M. galericulata*, and it is by no means impossible that such fungi exist in the islands upon buried wood or branches of shrubs. The striate stem and pale margin point to *M. polygramma* rather than to *M. galericulata*, and the 4-spored basidia confirm this affinity, since, as Mr. Carleton Rea kindly informed me, the basidia in *M. galericulata* are bisporous.

Naucoria Glebarum, *Cooke, MS.* *Agaricus Glebarum*, Berk. in Hook. f. Fl. Ant. ii. p. 447.
E. Falklands; on *Bolax* (=*Azorella*) *glebaria*, Berkeley Sound, *Hooker*.
Distrib. Falkland Islands, Kerguelen.
A very doubtful plant. Cooke has referred it, in an MS. note at Kew, to *Naucaria*; the spores, which agree with those of that genus, measure $8 \times 4\ \mu$.

Galera exquisita, *Cotton*, comb. nov. *Agaricus exquisitus*, Berk. in Hook. f. Fl. Ant. ii. p. 447 (not Vitt. Maug. tab. 18).
E. Falklands; on *Chiliotrichum amelloideum*, Port Louis, *Hooker*.
Distrib. Falkland Islands.
From the dried specimens, this would appear to be an exceedingly small and slender *Galera*. Unless a species specially connected with *Chiliotrichum* be discovered, it will, as is the case with so many of the early-described Agarics, probably remain unknown.

Agaricus campestris, *Linn. Fl. Suec.* ed. 2, p. 442, no. 1203.
W. Falklands; Byron Sound, Roy Cove, Carcass Island, *Vallentin*.
Distrib. All continents.
The ordinary Mushroom is frequent in the Falklands, where it is collected and eaten. Mrs. Vallentin notes that is very common in the short grass along the banks of Byron Sound, and that during February it is plentiful at Roy Cove.

Stropharia semiglobata, *Fr. Hym. Eur.* p. 287.

W. Falklands; on cow-dung, May 1910, *Vallentin*, 6, 15, 25, 28, 34.

Distrib. Probably cosmopolitan.

The well-known *Stropharia semiglobata* is evidently a common fungus in the Falklands, several tubes collected on various occasions being forwarded. In one gathering (no. 6) the specimens were so large as to render doubtful their identity with the true *S. semiglobata*. On this account a somewhat detailed study of fresh British specimens was undertaken, the size of the spores, together with other microscopic characters, being specially noted. The results with regard to spore-variability have already been published (see Trans. Brit. Myc. Soc. 1913, pp. 298–300). The Falkland Islands specimens agreed exactly in microscopic characters with the English, and the two plants are clearly identical, the large size attained by some of Mrs. Vallentin's specimens being equalled occasionally in English gatherings.

Coprinus radiatus, *Fr. Syst. Myc.* p. 313. *C. floscula*, Berk. in Hook. f. Fl. Ant. ii. p. 448, tab. 162. fig. 2.

E. Falklands: Berkeley Sound, *Hooker*. W. Falklands; Roy Cove, *Vallentin*.

Distrib. Europe, America (probably cosmopolitan).

There is no type of *C. floscula* in existence, but Berkeley's original drawings are at Kew. These seemed so clearly to portray *C. radiatus*, one of the commonest dung-fungi in Europe, that I sent copies of the drawings and descriptions to Prof. A. H. R. Buller for confirmation. Prof. Buller replied that *Coprini* are well-known to be widely distributed, and that he saw "no ground whatever for making it a distinct species."

Panæolus papilionaceus, *Quél. Myc. Fr.* p. 55; *Pers. in Freycinet, Voyage*, p. 168.

E. Falklands, *Gaudichaud* (teste *Persoon*).

Distrib. Probably cosmopolitan.

Psathyrella falklandica, *Cotton*, sp. nov.

Pileus tenuis, glaber, e campanulato usque planus, subumbonatus, 3–4 cm. diam., margine striato interdum subrepando; color roseo-griseus, versus umbonem flavus. Stipes equalis, subcavus, fibrillosus, glabrescens, 5–6 cm. longus, 2–3 mm. crassus, stramineus. Lamellæ adnatæ, confertæ, 4–5 mm. latæ, griseo-brunneæ, margine albido. Cystidia numerosa, hyalina, ventricosa, lævia, apice plerumque bi-trifurcata, 70–90 × 14–17 μ. Sporæ ellipsoidæ, purpureo-brunneæ, 9–11 × 4·5–5 μ.

Ab *P. atomata*, stipite stramineo, cystidiis trifurcatis distinguenda.

W. Falklands, *Vallentin*, 5.

The present very pretty species closely resembles *P. atomata*, having the

same pinkish-yellow pileus and general appearance. Mrs. Vallentin notes that it has a yellowish stem, and a further difference from that species is found in the almost constantly present prongs at the apex of the cystidia. The prongs vary from 5–10 μ long, and have not been observed as regularly present in any other species of *Psathyrella* which I have been able to examine.

Cystopus candidus, *Lév. in Ann. Sci. Nat.* sér. 3, viii. (1847) p. 371. *Uredo candida*, Pers., Berk. in Hook. f. Fl. Ant. ii. p. 451.

E. Falklands; on *Arabis macloviana*, Sulivan, d'Urville (*teste* Crié).

Distrib. Probably cosmopolitan.

Hooker's specimen, received from Captain Sulivan, has been re-examined, and no difference can be detected between it and common European species. The plant has also been recorded from various parts of the American continent as well as from Africa, and it is probably cosmopolitan. Massee remarks:—"The Kerguelen Land Cabbage (*Pringlea antiscorbutica*), although exempt from the fungus (*C. candidus*) in its native land, could not be kept in cultivation at Kew owing to attacks of this parasite" ('Mildews, Rust, and Smuts,' 1913, p. 11).

Puccinia Violæ, *DC. Fl. Fr.* vi. p. 62.

E. Falklands; on *Viola maculata*, Port Stanley, *A. W. Hill*. W. Falklands, *Vallentin*.

Distrib. All continents except Australia.

Æcidial stage only. Several species of Uredineæ are known on *Viola*; and I am indebted to Mr. W. B. Grove for confirming the identification of this specimen, and also for critical advice on the three following species.

Æcidium Pratiæ, *Speg. Fungi Fuegiani*, p. 53. no. 147.

E. Falklands; Port Stanley, *A. W. Hill*. W. Falklands, *Vallentin*.

Distrib. Staten Island, Falkland Islands.

A small number of the æcidia of this fungus, discovered by Spegazzini on Staten Island, were detected on the material of *Pratia repens* collected both by Mrs. Vallentin and Mr. Hill.

Uredo Chiliotrichi, *Cotton*, sp. nov.

Sori hypophylli, in greges rotundatas 3–4 diam. collecti, in tomento plantæ nutricæ plus minusve nidulantes. Uredosporæ longe pedicellatæ, flavescentes, globosæ vel ovatæ, 25–30 × 18–22 μ, echinulatæ.

In foliis *Chiliotrichi amelloidei*. Roy Cove, Shallow Bay, Saunders Island, *Vallentin*, 58.

No rust-fungus has previously been described as occurring on *Chiliotrichum*, which is a composite allied to *Olearia*, and confined in its distribution to the southern part of South America.

Phragmidium Rubi-geoidis, *Cotton*, sp. nov. *P. incrassatum*, Crié in Compt. Rend. lxxxvii. (1878) p. 532 (*non* Link).

Uredosori epiphylli, congesti, minuti, 0·3–0·5 mm. diam., interdum confluentes, bullati, aurantiaco-flavi, profunde immersi dein excidentes. Sporæ ovatæ vel oblongæ, 15–25 × 12–15 μ, flavidæ, basi excepta acute echinulatæ, aparaphysatæ.

In foliis *Rubi geoidis*, Roy Cove, *Vallentin*, 60.

Crié ('78) recorded a *Phragmidium* on *R. geoides*, referring it to *P. incrassatum*, Link (=*P. Rubi*, Wint.). Since that date our knowledge of the Uredineæ has greatly increased, and it is evident that the Falkland Islands species differs from the true *P. Rubi* if only in the smaller spores. Mr. Grove drew my attention to unusually bullate sori and the absence of clavate paraphyses, which are so marked a feature in the uredosori of most species of *Phragmidium*. The sori penetrate the whole depth of the mesophyll, and at length drop out, leaving a deep cavity. *R. geoides* occurs only in Fuegia and the Falklands.

? Triphragmium Ulmariæ, *Wint. Pilze*, p. 225. .

E. Falklands ; on *Acæna ascendens*, d'Urville, *teste* Crié.

Distrib. N. Europe, Siberia, Japan, N. America.

As has been the case with the last plant, further investigation will probably show that the rust-fungus on *Acæna ascendens* is a distinct and new species.

Lycoperdon cælatum, *Bull. Champ.* p. 130, tab. 430.

W. Falklands ; Shallow Bay, *Vallentin*, 46.

Distrib. Europe, N. and S. America, New Zealand.

For assistance with this and the following species I am indebted to Mr. C. G. Lloyd. He informs me that the photograph and spores indicate that specimen 46 is referable to *L. cælatum*, though it differs from the usual form in the absence of stalk. The single Hooker specimen referred by Berkeley to this species was wrongly named, but is now indeterminable.

L. giganteum, *Batsch, Elench.* fig. 165.

W. Falklands ; Shallow Bay, *Vallentin*, 45 & 46.

Distrib. Europe, N. America, Australia.

Photographs and specimens leave no doubt as to the identity of this. Mrs. Vallentin notes that the plants sometimes grow to an immense size, one specimen measuring 3 feet 10 inches in circumference. The capillitium is about 10 μ thick, and the spores smooth, olive, globose, and 4 μ diam.

L. lilacinum, *Speg. Fung. Arg.* p. 1. no. 110.

W. Falklands ; Roy Cove, *Vallentin*, 37.

Distrib. Southern Europe, N. and S. America, Africa, Japan.

A fine though rather old specimen of this distinct and widely distributed species. The plant is common in South America, and often grows to a large size.

Species Excludendæ.

Polyporus versicolor, *Fr.*, *Berk. in Hook. f. Fl. Ant.* ii. p. 448.

This was found on imported timber, and cannot be considered as belonging to the flora.

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EXPLANATION OF THE PLATES.

Plate 4.

Fig. 1. *Durvillea Harveyi*, Hook., exposed on rocks at low-water line. The ball and socket-like holdfasts are visible in the specimens in the foreground to the left.

2. *Durvillea* and *Lessonia* Association. Growing in fully exposed localities and just emerging at low-water.

Plate 5.

Chordaria linearis, Cotton, comb. nov. Dried specimen, about ¾ natural size.

PLATE 6.

Fig. 1. *Endoderma maculans*, Cotton, sp. nov. Surface view, showing filaments growing directly across the cells of *Nitophyllum*, and the commencement of the formation of pseudoparenchymatous tissue. (× 200.)

2. Ditto. Pseudoparenchymatous tissue with ripe sporangia and also those which have already discharged their spores. (× 400.)

3. *Chordaria linearis*, Cotton, comb. nov. Transverse section of a rather young branch with ripe sporangia. (× 400.)

4. Ditto. Longitudinal section of a somewhat older branch, showing elongation of assimilating filaments and swollen terminal cells. (× 400.)

PLATE 7.

Phyllophora cuneifolia, Hook. et Harv. One of Hooker's original Falkland Islands specimens now at Kew (nat. size). In other specimens the segments are more broadly cuneate.

PLATE 8.

Fig. 1. *Pteridium Bertrandii*, Cotton, sp. nov. Portion of a large female plant bearing cystocarps.

2. Do. Fragment of a tetrasporic plant showing disposition of tetraspores on either side of the midrib.

3. Do. Fragment of a male plant with antheridial patches (not visible in the photograph) in the young segments. (All nat. size.)

PLATE 9.

Fig. 1. *Lithothamnium Patena*, Heydr. Vertical section of thallus showing concentric arrangement of cells of the hypothallus.

2. *Lithothamnium neglectum*, Fosl. Cellular filaments of hypothallus.

3. *Epilithon Vallentinæ*, Lemoine, sp. nov. Cellular filaments seen from above.

4. Do. Rather small specimens on the Red alga *Glossopteris Lyallii*, J. Ag. (Nat. size.)

PLATE 10.

Fig. 1. *Pseudolithophyllum discoideum*, Lemoine. Young crusts on a limpet-shell.

2 Do. Older crust showing the conceptacles, visible as minute points, over the whole surface of the alga.

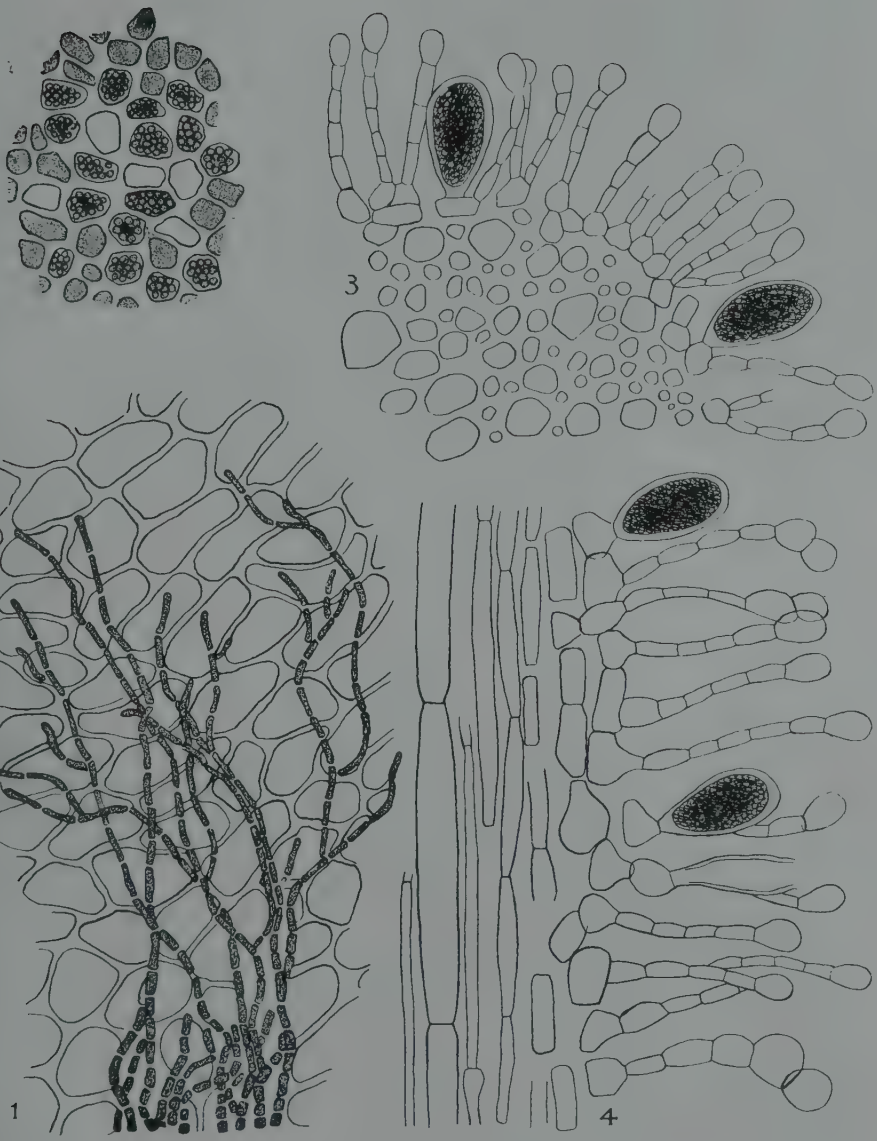
Figs. 3–6. *Lithothamnion neglectum*, Fosl., showing the different forms presented by the encrusting thallus. Figs. 3 and 4. Two of the commonest and most characteristic forms. Fig. 5. Crusts growing irregularly one above the other. Fig. 6. The right top corner shows characteristic young thalli, whilst the rest of the shell is covered by a single large adhering crust. (All nat. size.)

1

2

FALKLAND ISLANDS ALGÆ.

FALKLAND ISLANDS ALGÆ.



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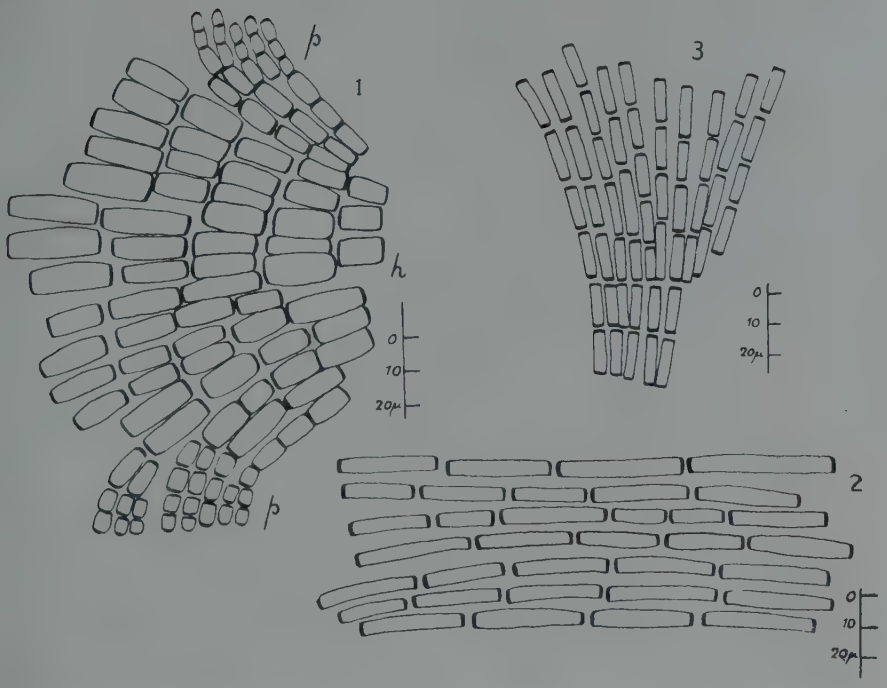

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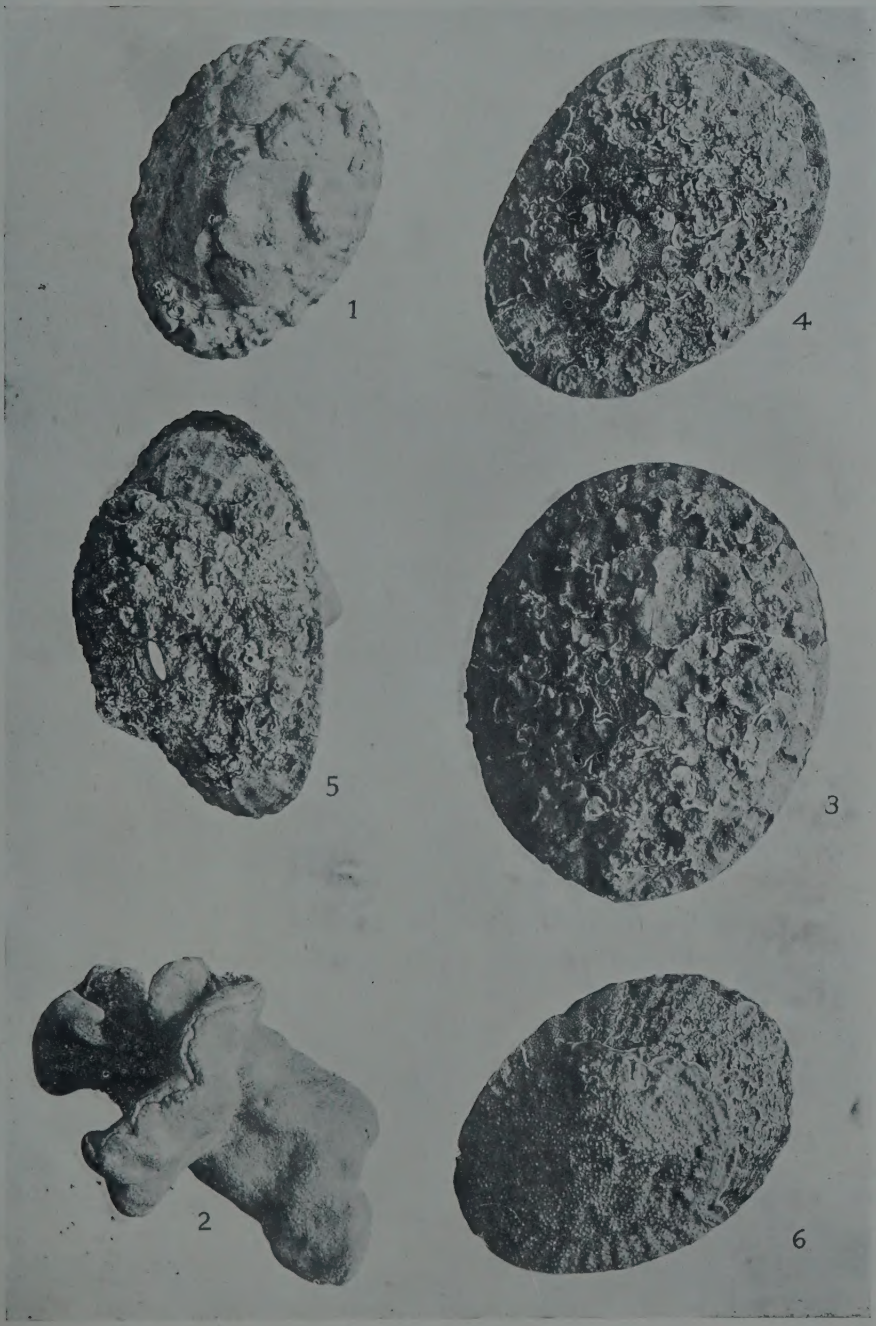

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